97th Congress
2d Session

COMMITTEE PRINT

RAPID POPULATION GROWTH IN THIRD WORLD COUNTRIES: AN OVERVIEW OF SOCIAL AND ECONOMIC EFFECTS AND THEIR RELATIONSHIPS TO U.S. MULTINATIONAL CORPORATIONS

PREPARED FOR THE

COMMITTEE ON FOREIGN RELATIONS
UNITED STATES SENATE

BY THE

CONGRESSIONAL RESEARCH SERVICE
LIBRARY OF CONGRESS

APRIL 1982

Printed for the use of the Committee on Foreign Relations

U.S. GOVERNMENT PRINTING OFFICE
90-343 O WASHINGTON: 1982

5382-15

COMMITTEE ON FOREIGN RELATIONS

CHARLES H. PERCY, Illinois, *Chairman*

HOWARD H. BAKER, JR., Tennessee	CLAIBORNE PELL, Rhode Island
JESSE HELMS, North Carolina	JOSEPH R. BIDEN, JR., Delaware
S. I. HAYAKAWA, California	JOHN GLENN, Ohio
RICHARD G. LUGAR, Indiana	PAUL S. SARBANES, Maryland
CHARLES McC. MATHIAS, JR., Maryland	EDWARD ZORINSKY, Nebraska
NANCY L. KASSEBAUM, Kansas	PAUL E. TSONGAS, Massachusetts
RUDY BOSCHWITZ, Minnesota	ALAN CRANSTON, California
LARRY PRESSLER, South Dakota	CHRISTOPHER J. DODD, Connecticut

EDWARD G. SANDERS, *Staff Director*
GERYLD B. CHRISTIANSON, *Minority Staff Director*

LETTER OF SUBMITTAL

CONGRESSIONAL RESEARCH SERVICE,
THE LIBRARY OF CONGRESS,
Washington, D.C., September 25, 1981.

Hon. CHARLES MCC. MATHIAS,
Chairman, Subcommittee on International Economic Policy, Committee on Foreign Relations, U.S. Senate, Washington, D.C.

DEAR MR. CHAIRMAN: I take great pleasure in transmitting a report entitled Rapid Population Growth in Third World Countries: An Overview of Social and Economic Effects and their Relationships to U.S. Multinational Corporations. This report was prepared in response to your request for an overview of what role U.S. multinational corporations might play in aiding the economic development of third world countries undergoing rapid population growth.

The report briefly reviews the existing and potential economic and social consequences of rapid population growth in developing countries and attempts to identify those areas where additional research is necessary. Sketched out are the linkages between rapid population growth in developing countries and employment problems, manufacturing industrialization, the role of foreign direct investment in economic development, food production and needs, host government pressures, and U.S. material needs and dependency. Many questions are raised, particularly with respect to the interests of multinational corporations as requested.

The report was co-ordinated by Dennis M. Roth, Specialist in Labor Economics and Relations and Dennis L. Little, Specialist in Futures Research and Population Policy. Also contributing to the report was David J. Cantor, Analyst in Energy Economics; Gary Guenther, Analyst in Industry Economics; James E. Mielke, Specialist in Marine and Earth Sciences; Marion M. Montague, Analyst in U.S. Foreign Policy; and A. Ellen Terpstra, Analyst in Agricultural Policy.

We hope this report will meet the needs of your subcommittee and other congressional offices interested in this area.

Sincerely,

GILBERT GUDE, *Director.*

LETTER OF TRANSMITTAL

UNITED STATES SENATE,
COMMITTEE ON FOREIGN RELATIONS,
Washington, D.C., December 15, 1981.

Hon. CHARLES H. PERCY,
Chairman, Committee on Foreign Relations, United States Senate, Washington, D.C.

DEAR CHUCK: I wish to request that the Committee authorize the printing of the attached study, entitled "Rapid Population Growth in Third World Countries: An Overview of Social and Economic Effects and Their Relationships to U.S. Multinational Corporations," which was prepared by the Congressional Research Service at my request. You probably recall that the study was distributed and discussed at a luncheon for business and government leaders which I hosted last September.

CRS has received many requests from the general public for copies of the study. In view of the wide interest in international population issues at this juncture, I believe it would be appropriate to issue the study as a Committee print as soon as possible.

Sincerely,

CHARLES McC. MATHIAS, JR.,
United States Senator.

CONTENTS

	Page
Letter of submittal	III
Letter of transmittal	V
Global and Third World population patterns: An overview	1
The labor force, employment, and economic development in developing nations	10
Population growth, industrialization, and the role of multinational corporations in developing countries	16
Population growth, foreign direct investment, and economic development in developing countries	24
Population growth and food availability in developing nations	37
The effects of overpopulation on Government programs in developing countries	47
U.S. material dependency and Third World population trends	54

GLOBAL AND THIRD WORLD POPULATION PATTERNS: AN OVERVIEW*

INTRODUCTION

Population growth and its consequences have been a concern of the scholar for years. To cite just a few examples over 200 years ago, Adam Smith discussed some of the long-term consequences of population growth in "An Inquiry Into the Nature and the Causes of the Wealth of Nations" (1776). In this book, he speculated that resource exhaustion and decreasing returns on new investment would, over the long-term, inhibit the economy from keeping up with the population. Thomas Malthus in his "A First Essay on Population" (1798) argued that population would continue to grow geometrically while the production of food would grow linearly. David Ricardo, in the early 1800's, and John Stuart Mill, in the mid-1800's, also were concerned with the deleterious effects of population growth. The concern over population growth subsided somewhat with the rapid pace of technological progress. More recently in 1972 with the publication of "The Limits to Growth" by Donella H. Meadows, et al., the population growth debate again captured the attention of many scholars and the public. This book presented the results of a computer model of the world and its basic point was that, because of the momentum of population growth, demographic and economic growth would eventually exceed the world's limits unless earlier measures were taken to control that growth. And finally, Robert S. McNamara, in his 1979 Belgrade Address to the Board of Governors of the World Bank, stated:

> As I have pointed out elsewhere, short of nuclear war itself, it [population] is the greatest issue that the world faces over the decades immediately ahead . . . it inevitably is: a central determinant of humanity's future, and one requiring far more attention than it is currently receiving.

What's new in the population growth debate is the relatively recent rapid population growth. The growth of the global population probably did not exceed one-half of 1 percent per year until about 1800 when the population reached 1 billion. Since 1930 the population of the world has been growing at around 2 percent a year and thus is doubling approximately every 35 years. Table I reflects global population over approximately a 10,000-year period. It took more than a million years for global population to reach 1 billion; another 100 years to reach the second billion; 30 additional years to reach the third billion; and 15 more years to reach the fourth billion.

---

*Dennis L. Little, specialist in Futures Research and Population Policy.

90-343 O - 82 - 2

TABLE I.—GLOBAL POPULATION [1]

Year	Population
8000 to 6000 B.C.	Below 10 million.
1 A.D.	133 to 400 million.
1650	460 to 475 million.
1750	800 million.
1800 to 1850	1 billion.
1930	2 billion.
1960	3 billion.
1975	4 billion.
1987	5 billion.
1998	6 billion.

[1] Van der Tak, Jean, Carl Haub, and Elaine Murphy. Our Population Predicament: A New Look. Population Reference Bureau. v. 34, No. 5, December 1979, p. 3–4, and Organization for Economic Cooperation and Development. Midway Through Interfutures. July 1977. Population figures for 1987 and 1998 are estimates based on 1979 rates of population growth.

For the policy maker, some of the important questions appear to be: What is the current level and distribution of the global population; will existing rates of growth continue; will the growth be evenly distributed throughout the continents; can and should the existing rate be decreased; and what might be the impact of the existing rates of growth upon the economy, the labor force, natural resources, our urban centers, and the national security of the United States? The remainder of this chapter sketches trends in global and Third World population, including some current estimates and future projections, and highlights the impact of existing and projected rates of growth on the areas identified above. Other papers in this report will examine these areas in greater depth.

Global and Third World Population: Current and Future Projections

No one knows with certainty the exact size of the population of the world at any given time. In the developing countries, where 70 percent of the world's population is presumed to live, demographic statistics are often sparse, and the machinery for their collection is unreliable. Even the United States, with its sophisticated and computerized techniques, reportedly missed 5 million people in the 1970 census, and found almost 5 million they hadn't anticipated in 1980. Efforts to predict population changes, over an extended period of time, using current rates of fertility, mortality, and migration have been, for the most part, unsuccessful. Today, most demographers do not make a point forecast, but rather a range of projections using different birth, mortality, immigration and emigration rates.

In general, the World Bank, the United Nations, and the Population Reference Bureau report a current population of approximately 4.5 billion with the range between the United Nation's high and low estimates being approximately 145 million. The Population Reference Bureau estimates the population to be increasing at the rate of 144 persons a minute; 1.5 million a week; and 75.7 million persons a year.[1] This growth will not be uniform. Table II reflects

[1] Haub, Carl. Population Data Sheet. Population Reference Bureau. April 1981.

the population growth ranges by region and continents. Over 90 percent of the population growth between 1980 and 2000 will take place in the developing countries.[2] The rate of natural increase and the time for doubling the population by continent ranges from 0.4 percent (178 years) in Europe to 2.9 percent (24 years) in Africa.

TABLE II.—POPULATION GROWTH PATTERNS BY REGION

Region	Mid-1981 population (millions)	Rate of natural increase	Years to double population [1]	Year 2000 population (millions)	Percent population under 15	Urban population percent	Per capita GNP [2]
World	4,492	1.7	41	6,095	35	41	$2,340
More developed	1,144	0.6	113	1,255	24	71	7,260
Less developed	3,348	2.1	34	4,840	39	30	560
Africa	486	2.9	24	833	45	28	620
Asia	2,608	1.8	39	3,564	37	28	800
North America	254	0.7	95	286	23	74	10,710
Latin America	366	2.3	30	562	40	63	1,580
Europe	486	0.4	178	511	23	71	6,820

[1] At current growth rates.
[2] In U.S. dollars.

Source: Haub, Carl. Population Data Sheet. Population Reference Bureau. April 1981.

Up until the mid-1960's, there was little reduction, if any, in developing country birth rates. Since that time significant declines have been recorded in all of the developing world's major regions with the exception of sub-Sahara Africa. The declines have averaged 15–20 percent. However, the mortality rates have also been declining so that the slowdown of population growth has not been large enough to have any significant impact on long-term population growth. At a 2.3 percent annual rate of growth the population will double every 30 years; at a 2.2 percent rate it will double every 31 years; and at a 2.1 percent rate it will double every 34 years. High fertility rates have generated very youthful populations in the Third World so that even if the number of births per women drops dramatically, the number of women of reproductive age will continue to increase for many decades. Consequently, population growth will continue for at least half a century.[3]

The latest United Nations' medium-range estimates indicate that world population would stabilize at approximately 10.5 billion persons in the year 2110 if the present tempo of population programs and policies are maintained. Over 9 billion of these people would be living in the developing countries. Over this period of time the population growth rates of developing countries would decline as follows: 1980—2.1 percent; 1985—2 percent; and 2000—1.8 percent. The largest number will be added to the population of South Asia, and South Asia and Africa will account for about 60 percent of the world's population at the time of stabilization.[4]

[2] The World Bank defines developing countries as low income countries with a GNP per person of $360 and below; and middle income countries with a GNP above $360.
[3] Gwatkin, Davidson R. Prepared statement before the Subcommittee on International Economic Policy, Committee on Foreign Relations, U.S. Senate, Feb. 27, 1981, and Titelbaum, Michael. Testimony before the Subcommittee on Economic Policy, Committee on Foreign Relations, U.S. Senate, Feb. 27, 1981.
[4] Salas, Rafael M. The State of World Population 1981. United Nations Fund for Population Activities, 1981.

Some of the implications of current and projected population trends are highlighted in the next section of this paper. For a more detailed examination and for a wider range of trends, the reader will need to refer to the individual chapters which follow.

Population Growth and the Third World Economy

In 1979 the average per capita income of less developed countries was $560.[5] However, absolute poverty means more than low income. It also means malnutrition, poor health, and lack of education. Using very imprecise calculations the number of people in absolute poverty in developing countries (excluding China and other centrally planned economies) is estimated at 780 million. Half of the people in absolute poverty live in South Asia, mainly in India and Bangladesh; one-sixth live in East and Southeast Asia; one-sixth in Sub-Saharan Africa; and the rest are divided among Latin America, North Africa, and the Middle East.[6]

During the 1960's and early 1970's, the economy of the developing countries as a whole grew at an average rate of 4.5–5.0 percent. At the same time the Third World's population growth was well over 2 percent annually so that per capita incomes rose only about half as rapidly as GNP. Growth rates in per capita incomes for developing countries are now around 1 percent.[7]

High rates of population growth eat into resources that could otherwise be available for investment in development. Former Ambassador Marshall Green cited Bangladesh as an illustration of this point:

> When you have a country like Bangladesh, where the population growth every year is over 2 million people, you have to have 400,000 more tons of grain, 700,000 more jobs, 300,000 more dwellings, and 11,000 more schools. How are you going to aggregate the capital necessary for development when infrastructure costs are so enormously high.[8]

Because population growth in developing countries has acted to check increases in per capita incomes, most of the consumers in these countries still have little purchasing power and what they do have barely covers subsistence needs for food, fuel and shelter.[8]

Labor Force Growth

On an annual basis, the world's labor force is growing by approximately 50 million workers a year. In the early 1900's it was growing at a rate of 50 million workers a decade.[9] Since the labor force growth is largely determined by population growth, it is possible to forecast, with reasonable accuracy, the size of the labor force in the year 2000. Table III reflects the growth from 1950 to 1975 and the projected growth for 1975 to the year 2000.

---

[5] Haub, Carl. 1981 World Population Data Sheet.
[6] World Bank. World Development Report, 1980.
[7] Gwatkin, Davidson. Statement before the Subcommittee on International Economic Policy. Feb. 27, 1981, and Population Crisis Committee. Third World Population Growth from a Business Perspective.
[8] Cited in van der Tak, Jean. Our Population Predicament: A New Look, p. 20.
[9] Population Crisis Committee. Labor Force Growth, Unemployment, and Migration. Population Briefing Paper No. 7. September 1977.

TABLE III.—INCREASE IN WORLD LABOR FORCE, WITH PROJECTIONS TO 2000

[In millions]

Region	1950–1975	1975–2000
Developed	123	118
Developing	423	782
World total	545	900

Source: Cited in Newland, Kathleen. Global Employment and Economic Justice: The Policy Challenge. Worldwatch Paper No. 28, April 1979.

One result of this growth should be a significant shift in the regional distribution of the labor force. Workers from industrial nations who currently represent one-fourth of the world's labor force may drop to one-seventh. The 600–700 million new jobs needed in the developing countries in the next 20 years are more than all the employment available in all industrialized countries in 1980. Although the figures are imprecise and subject to error, the challenge of finding work for almost one billion jobseekers by the year 2000 is enormous. These workers will be joining a labor force which in 1978 had approximately 50 million people unemployed and 300 million more who were underemployed. One forecast estimates that registered global unemployment will pass the 100 million mark by 1990. The problem of job creation could be further aggravated by advances in microelectronics which would allow the developed countries to compete effectively with the cheaper labor of the developing countries.

As just one illustration, in 1976, 21 developed countries imported from developing countries $27 billion worth of manufactured goods. In the textile, clothing, and footware industry, a large import area, microelectronics allows high flexibility and automation. Self-programming robotic arms can be used for cutting and computerized systems for design, producing patterns, monitoring the quality of the fabric and guiding laser beam cutters. The end result could be the transfer of employment opportunities in the developing nations to the high technology of the developed nations.[10]

Urban Third World Growth

Along with the rapid growth in population, the Third World has experienced an explosion in the speed and magnitude of the growth of cities. While populations in the developing countries are doubling every 25 to 30 years, their large cities are doubling every 10 to 15 years, and the urban slums and shanty-towns in these cities every 5 to 7 years. In approximately a single generation these cities have absorbed over 400 million people—half through natural increase and half through migration. Approximately half of the residents do not have adequate access to minimal nutrition, clean

[10] Teitelbaum, Michael. Testimony before the Subcommittee on International Economic Policy, Committee on Foreign Relations, U.S. Senate. Feb. 27, 1981; Population Crisis Committee. Labor Force Growth, Unemployment, and Migration; Newland, Kathleen. Global Employment and Economic Justice: The Policy Challenge; and Rada, Dr. Juan F. Microelectronics, Information Technology, and Its Effects on Developing Countries. Unpublished paper prepared for the conference on Socio-Economic Problems and the Potentialities of the Application of Microelectronics at Work. The Netherlands, Sept. 19 to 24, 1979.

water, health facilities, primary education, public transport, and other public services.[11]

In 1950 there were seven cities of 5 million or more inhabitants and only two were in the developing countries. Cities of that size did not even exist until the start of the century when London reached that size. Today there are 26 cities that large or larger, and the United Nations predicts that there will be 60 cities of 5 million or more in the year 2000 and 46 of these will be in developing countries, with 18 having populations of better than 10 million. During the past decade Mexico City added 6 million to its population—equal to the combined Washington, D.C. and San Francisco metropolitan populations—and is expected to double in size by the year 2000. San Paulo and Rio de Janeiro in Brazil and Lima, Peru, are expected to have 25, 18, and 10 million inhabitants, respectively, by the year 2000.[12]

Cities of 25 or 30 million are well beyond the realm of existing human experience. Today's most populous urban areas are New York/Northeastern New Jersey and Tokyo/Yokohama, both at about 20 million. The speed at which such massive additions will occur seems likely to present severe planning problems, problems of implementation, and severe capital constraints. Robert S. McNamara places the investment cost at $215 billion (in current prices) over the next 20 years just to supply decent shelter to all poor urban families by the end of the century.[13] In New York City alone, it is estimated that more than $40 billion must be invested during the next decade to repair, service, and rebuild basic public works facilities.[14] Mexico City during the remainder of the century will need to maintain a city the size of New York and build another the same size.

Agriculture and Natural Resources in the Third World

In the early 1970's, one hectare (2.47 acres) of arable land supported an average of 2.6 persons in the world. By the year 2000 the same amount of land will have to support four persons. The Global 2000 report found that such increases in food production are technically feasible, but huge capital investments, large and secure energy supplies, and good luck with respect to weather will be required. The Global 2000 report also forecasts that production increases will result in major increases in real food prices. Many segments of the Third World may not be able to pay for the high costs of food or the costs of the energy needed to fuel their own food production. In 1980 the developing nations spent approximately $50 billion to buy oil, almost twice the amount they receive collectively

---

[11] McNamara, Robert S. An Address to the Board of Governors (World Bank). Belgrade, October 2, 1979, p. 12-13.

[12] McNamara, Robert S. An Address to the Board of Governors; Newland, Kathleen. City Limits: Emerging Constraints on Urban Growth. Worldwatch Paper No. 38, August 1980, p. 7; and Fox, Robert W. Latin America: New Realities. Geopolitics of Energy, v. 2, no. 12, December 1980, p. 6.

[13] McNamara, Robert S. Address to the World Bank, p. 7, and Teitelbaum, Michael, testimony before the Subcommittee on International Economic Policy.

[14] Choate, Pat and Susan Walter. American Ruins: Beyond the Public Works Barrel. Council of State Planning Agencies, 1981, p. 2-3.

from all outside sources for development assistance.[15] Expanding cities, discussed in the previous section, are expected to cover 25 million hectares of cropland, or about 2 percent of the total under current cultivation, between 1980 and the end of the century. The impact on total production may even be greater, for cities are commonly built on the most fertile land.[16]

If population growth continues at the same level as it did in 1975, the population would double by the year 2015, and consequently food production must double in the same period. Even if the rate of population growth slows considerably, it is clear that, barring catastrophe, world food production must double in the next 40 to 80 years. (It has taken a 12,000-year period—from the beginning of agriculture to 1975—to reach the current levels of production.) Despite awesome numbers, some are cautiously optimistic that this objective can be obtained. It will take massive investment (once again the need for capital); more and better trained agricultural scientists; and significant increases in the research and development budget of the private and public sector.[17]

Water

The Global 2000 report stated that while the world water supply can be expected to satisfy requirements through the end of the century, periods of spot shortages will become more and more frequent, particularly as demand for water for crop irrigation increases. Problems will be the most severe in those countries that are the least able, financially and technically, to increase their water supply. It has been estimated that about 80 gallons per day are required to maintain a family at the present level of usage in an industrialized country and that the minimum in the Third World is about 9 gallons per day.[18]

Renewable Natural Resources

There is specific evidence of population-related depletion of renewable natural resources. Per capita beef production has declined during 1977–79, but similar fluctuations have occurred since 1960. Mutton production has declined since 1972 and wool since 1972, but this may be more the result of changes in taste and the development of synthetics. It is unclear whether or not these are signs of global overload or merely manifestations of a temporary or local problem. Each case must be examined in further detail. If synthetics were to become more costly, relative to raising sheep, for example, or if new technologies are developed lowering the cost of raising sheep, these trends could reverse themselves.

It is clear that the per capita production of wood is down. Twenty-five years ago forests covered 25 percent of the world's land surface; in 1979 they covered 20 percent; by the year 2000, based on

---

[15] Population Reference Bureau. The Global 2000 Report and Implications for the United States. (Summary of hearings conducted by Subcommittee on Census and Population of the U.S. House of Representatives, Committee on Post Office and Civil Service, May 12, 1981.)

[16] Borlang, Norman E., R. Glenn Anderson, and Ernest W. Sprague. The Human Population Monster, 1980.

[17] Borlang, Norman E., et al. The Human Population Monster.

[18] Personal correspondence with Carl Haub, Research Demographer, The Population Reference Bureau.

present trends, it will fall to 16½ percent, and by 2020 to 14 percent. The majority of this deforestation is occurring in developing countries where energy price rises and population growth are intensifying pressure on fuel, wood and timber supplies.[19]

Third World Population Growth and U.S. Security Interests

The apparent relationship between high rates of population growth in most of the world's less developed countries and U.S. security interests has received little scholarly attention and the studies done by the public sector are primarily classified intelligence agency work.[20]

Nearly all those developing countries in which the United States and its allies have vital security interests suffer from serious population pressures. They include major suppliers (or countries with major reserves) of petroleum, such as Indonesia, Mexico, and Venezuela. They also include major suppliers of critical materials and metals used in the production or operation of key weapons systems or in other vital industries such as transportation and communications. Others such as Panama and Egypt dominate what strategic analysts identify as major "choke points" on important shipping lanes. The Egyptian population is doubling every 26 years; its urban centers are doubling every 20 years; and its external debt is 71.5 percent of its GNP. Other countries could block transshipments of strategic materials from landlocked neighboring countries. Because the United States, Western Europe, and Japan depend heavily on petroleum and strategic mineral imports and because Soviet dependency on such imports is comparatively negligible, political upheavals in one or more of these developing countries, leading to disruption of petroleum or mineral exports may be highly significant for defense and other industries in the West. Kenya, with the highest population growth rate in Africa, provides the United States with its only port facility for naval vessels in a region (the Horn of Africa) of great interest to the United States and the Soviet Union.

Concluding Observations

Demographic forecasts involve making assumptions about people's choices Historically, such assumptions have on several occasions turned out to be wrong, and in the year 2000, it is plausible that the same comments may be made about the population forecasts of 1980–1981. As illustrative none of the population forecasts made in the 1930's and 1940's, by our nation's best demographers, predicted a population of 200 million by even the year 2000. This level was actually reached in 1969.[21]

It is clear that for a number of reasons—the overall rate of population growth is declining in the world. From a global perspective; most people would probably say things are looking better. On a region-by-region or country-by-country basis, the picture is not as clear. In the Third World, Africa is experiencing population

---

[19] Lester Brown, President, The World Watch Institute.
[20] Sharon L. Camp. Ph.D., "World Population Growth and U.S. Security," 1981.
[21] Footnote omitted by author.

growth, that if it continues, would double its population in 24 years, and in Kenya, the population is currently doubling every 18 years. The central cities of Brazil, Mexico, Indonesia, the Philippines, and many others, at current growth rates, will double in 18 years or less. The implications for new markets and business opportunities are clear, but the capital demands, the social needs, and the potential for economic and social discontent leading to "tinderbox" situations must also be of concern. This is of particular concern for nearly all of the developing countries in which the United States has a vital security interest.

90-343 O - 82 - 3

THE LABOR FORCE, EMPLOYMENT, AND ECONOMIC DEVELOPMENT IN DEVELOPING NATIONS*

INTRODUCTION

As the population of the world increases, so does the challenge to find work for the ever-increasing number of job seekers. In developing countries the employment problem is extremely difficult to quantify; not only because of the inaccuracy of the data, but also because of the extreme underutilization of labor which the measure of unemployment does not capture. In this chapter, developing countries' population trends will be briefly examined as they may impact upon the world of work and upon economic development. Also discussed will be current strategies, being considered or tried, to alleviate the employment problems in developing countries.

As has been documented in an earlier chapter of this report, rapid population growth, albeit at a somewhat declining rate, is still a major phenomenon in less developed countries. While many argue that a key to economic development in these countries is through increased employment, the method for its achievement is not necessarily through the industrial sector or a general increase in agricultural production.

What is the linkage between rapid population growth and employment? While there are signs that world population growth has begun to decrease,[22] most of the people who will make up the world's labor force in the year 2000 have already been born. It is estimated that between 1965 and 1975, 570 million children passed the age of 15. Between 1975 and 1985 an additional 710 million already born children will pass this age. Between 1985 and 1995 the number passing 15 years of age could be 900 million, depending in part what happens to death and birth rates over the next several years.[23] Consequently, by 1995 the total world labor force (assuming the current 50-percent labor force participation rate) could grow by a billion people. Thus, while reducing rapid population growth is crucial to solving the long-run employment problem, it will not have much impact on reducing the need for jobs over the next couple of decades.

Most of the population growth discussed above will take place in less developed countries where the population is young (about 40 percent under the age of 15) and growing rapidly (doubling in about 35 years). Eight out of every nine new job seekers are expect-

*Dennis M. Roth, specialist in Labor Economics and Relations.

[22] World Population: The Silent Explosion, Department of State Bulletin, Fall 1978 (Bulletin Reprint).

[23] These estimates are based on International Labour Office, Labour Force Estimates and Projections 1950-2000, Geneva, 1977.

ed to be in these countries. According to International Labor Organization (ILO) projections, the number of persons in the labor force of developing countries labor force will have increased from 1,011 million in 1970 to 1,933 million in 2000, or by 922 million (91 percent) in a single generation. From 1975 to the year 2000 Asia's workforce is projected to grow by 60 percent to 1.5 billion, Africa's by 86 percent to 284 million, and Latin America's to more than double to 207 million. By the 1990's, the ILO estimates that the labor force in developing countries will grow by nearly 50 million each year.

Employment and Unemployment

Most often, the measure used for labor market distress is unemployment. However, in developing countries this statistic is an inadequate guide as to the absence of jobs. Since there is no "safety net" as in developed countries (social security and unemployment insurance; for example), people who want to work in developing nations must find some kind of employment, regardless of how well it matches their job skills or how well it pays. For job seekers in these countries being unemployed is not an alternative if they wish to survive. Thus, because of widespread underemployment as well as joblessness, reported unemployment does not reflect the actual employment problems of less developed nations.

Underemployment resulting from the shortage of jobs and working for subsistence wages are the real employment problems of developing countries. The ILO estimated that in 1975 approximately 280 million people, or about 40 percent of the labor force, were unemployed or underemployed in the non-Communist Third World. While 33 million were unemployed, the rest were underemployed, i.e., seeking additional work because of insufficient income to meet their basic needs or because they worked less than a full day. Large labor surpluses have led to the subdivision of productive work among more and more people. Consequently, the large and even increasing pool of workers, predominantly young and inexperienced, also reduces productivity and earnings.

Measured unemployment in developing countries occurs primarily in the urban sector.[24] However, studies of urban unemployment have found that these data reflect the employment problems of a rather special group: those having some alternative means of support while they search for a job, such as young adults who still maintain themselves off family funds or a relative from a rural area who stays with family or friends. For this reason several analysts of developing world employment problems suggest using poverty as the yardstick. This measure encompasses the adequacy of employment, taking into account both unemployment and underemployment, reflecting the welfare consequences of the employment situation.

Employment Problem Solutions

There appears to be a general concensus developing that underdeveloped nations should proceed on an employment program that

[24] Harrison, Paul. Workless of the World. People, v. 6, no. 3. 1979, p. 4.

emphasizes basic needs.[25] The concensus presumes that development efforts undertaken in these countries should embrace policies which directly affect the level of living of the poorest as well as those which promote industrial growth, to the extent that the profits resulting from this growth benefit all members of society. The basic needs development emphasis represents a significant shift from earlier policies which argued that the manufacturing sector should serve as the engine for growth and that the rural population served as a ready reservoir of labor for industrialization.[26]

The foundation for the supporters of the basic needs approach is that past investment in large-scale, capital-intensive industrial and agricultural production has not abated the employment problem of developing countries. The basic needs approach argues that the primary objective of economic development should be to raise the level of living of the poorest, both through income redistribution and through growth. By satisfying the needs of the poorest, these families will become able to spend their income less on food and more on industrial products and services, and consequently increase the demand for these products. Furthermore, basic need strategists note that, at present, capital is subsidized at the expense of labor and that removal of the subsidy would favor a shift to more labor-intensive production processes. Implementation of the basic strategy also would lead to agricultural and rural development to reduce disparities between economic sectors and should increase labor productivity as higher levels of basic needs are achieved.

Manufactured consumer goods brought by lower income groups generally are produced using standard operations that require less technical and managerial supervision and more use of unskilled labor than is the case of manufactured goods consumed by higher income groups. Increases in the demand for simple manufactured goods will lead to an increase in the demand for producer goods. There is a strong potential for these to be manufactured in the country itself. Thus, by utilizing production processes which favor unskilled workers and small farmers, basic-needs employment and development policies will not necessarily hinder industrialization, but rather alter the mode of production so that it is more favorable to the work force in developing countries.

Concentration on capital-intensive, high-skilled industrialization has been found to have worked to the detriment of agricultural workers in many developing nations.[27] This industrial bias has led to an urban bias, attracting people from the rural areas to the cities, adding to the urban employment problem. Attempts to cure urban employment problems may prove to be self defeating since creation of more jobs in the city will only add to the magnetism of

---

[25] Van Der Hoven, Rolph. Employment, Basic Needs and Industrialization: Some Reflections on the Lima Target. Industrial Labour Review, v. 119, no. 4, July-August 1980, pp. 439-453 and Hicks, Norman and Paul Streeten. Indicators of Development: The Search for a Basic Needs Yardstick. World Development, v. 7, 1979, pp. 567-580.

[26] See, for example, Newland, Kathleen. Global Employment and Economic Justice: The Policy Challenge. Worldwatch Paper 28, Washington, D.C., April 1979 and Rolph Van Der Hoven. Employment, Basic Needs and Industrialization: Some Reflections on the Lima Target. International Labour Review, v. 119, no. 4, July-August 1980.

[27] See Van Der Hoven, Rolph, op. cit., and Kathleen Newland, op. cit.

the cities. Thus, rural and agricultural development balanced with an urban employment program should yield high returns.

To date, most developing nations have attempted to emulate Western ways to increase food production, such as large commercial farming and mechanization. However, in those countries where land ownership is private and individual, these actions usually result in increased unemployment. There are two primary reasons for this: (1) a decrease in the size of the farms as land is divided up among children, and (2) an increase in the productivity of the worker over the increase in the productivity of the land. While the first trend will be difficult to reverse; actions can be taken to change the second. High-yielding varieties of seeds have been found to require more labor than traditional varieties. For example, high yielding varieties of rice need to be planted carefully in rows, be weeded more intensively, and require more fertilizer. Higher yields also would require more labor in harvesting and processing.

Developing the proper infrastructure for agricultural development also would heavily utilize currently idle labor. The putting-in, extension, and improvement of irrigation systems would greatly increase yields by allowing two, and sometimes three, crops to be grown each year. Increased yields would translate into an increased demand for labor to plant and harvest. Furthermore, extra jobs would be created in building, maintaining, and controlling water supplies.

If smaller plots can be made to yield sufficient quantities to support a family, the number of individuals seeking laboring work in rural areas could decline and real wages could rise (oversupply of workers decreased). For self-sufficiency to take place, however, rural residents will need credit, supplies, and technical assistance.

It is here where multinational corporations could play an active role. Investment in rural agricultural development could work in their behalf in several ways. First, helping families to rise above self sufficiency in food would yield additional income for them to purchase manufactured goods. Second, a healthier and not starving population would yield a more productive labor force. And third, if the national governments do not have to spend scarce resources on maintaining its population, more funds could be directed toward educating the work force and creating the approporiate infrastructure necessary to encourage industrial development. Thus, it would be in the multinational corporations best interest to help support, financially and otherwise, programs which would reduce population and help eradicate poverty.

In summary, mechanization and urban industrialization, by themselves, are not necessarily positive economic development steps for underdeveloped nations. Rapid population growth almost dictates that any development policy contain a rural employment and basic-needs component. Investment in increased agricultural output is a must for these countries, but the increased output should not be at the expense of the rural labor force. Rather, the productivity of the land needs to be increased faster than the productivity of the farm laborer.

Many of the workers unable to survive on their small plots migrated to the cities in search of a livelihood. But the cities have not been able to offer enough employment opportunities to accommo-

date the exodus from the rural areas. A large part of the reason for this has been the nature of industrial development in the cities. Employment in industry in the developing nations has grown at a slower rate than manufacturing output. Thus, the emphasis on industrial development was to produce more goods with fewer people.

It should also be noted that even at rapid rates of growth, industry would be able to employ only a small absolute number of workers because the expansion would be taking place from a small base (in 1970 industry employed 22 percent of Latin American workers, 17 percent of Asian workers, and 11 percent of Africans). Furthermore, the establishment and growth of large-scale industries has led to the decline of traditional small-scale industries such as home spinning and weaving.

What has happened to the unsuccessful urban job seeker? They have found employment in the "informal" or unorganized sector of tiny businesses. These include street peddlers, shoeshine boys, porters, beggars, small merchants, and backyard workshops. Some estimate that 40 to 60 percent of the urban workforce is engaged in these types of activities.

Concluding Remarks

Even though urban areas have been growing very rapidly in most developing countries, the majority of people are still rural inhabitants: about 40 percent in Latin America, 72 percent in Africa, and 72 percent in Asia.[28] The bulk of the labor force up through the year 2000 is already born and development policies of underdeveloped countries must take this fact into account. Subsistence living and the lack of productive work will continue to be major problems in these countries, both in the cities and rural areas. Employment policies, therefore, must address themselves to labor-intensive as opposed to capital-intensive production processes, both in agriculture and in industry. If agricultural productivity from the land can be increased and at the same time make more use of rural labor, rural workers will be productively employed not only in the agricultural sector but also in small-scale manufacturing, construction, wholesale and retail trade, and other secondary activities. By bringing the incomes of rural inhabitants above subsistence levels, the demand for the secondary products will develop. Furthermore, self-sufficiency in the rural areas will stem the migration tide to urban areas.

There is also a potential to utilize the rural labor force to build up the necessary infrastructure for development and to aid in the replenishment of natural resources. Such projects could include reforestation, water conservation (irrigation, drainage, and flood control), land reclamation, soil conservation, and sanitation. Labor-intensive projects in these areas would make heavy use of the underutilized labor in the rural areas and curb the flow of people into the cities.

Capital-formation in urban areas, by itself, has proven to have been an inadequate solution to developing countries' employment

[28] Haub, Carl. 1981 World Population Data Sheet. Population Reference Bureau. April 1981. These are estimates for mid-1981.

problems. It has led to a smaller demand for labor, but at the same time drawn rural workers into the cities in hope of employment. With a growing labor force already born, actions will need to be undertaken to develop rural areas along with the urban areas to provide productive work for those who need and want it.

POPULATION GROWTH, INDUSTRIALIZATION, AND THE ROLE OF MULTINATIONAL CORPORATIONS IN DEVELOPING COUNTRIES*

Rapid population growth in developing countries and, especially, in urban centers is increasingly a major concern for these countries. This growth, proceeding at an annual rate of over 2 percent for the countries as a whole and at a rate of 4 percent in urban areas, is leading to an overcrowding in the cities and large towns, a deterioration in health and sanitation levels, and increasing unemployment and poverty. These trends are forcing a diversion of scarce financial and physical resources from investment in economic development projects to programs intended to ameliorate the situation of the urban poor.

The growth of manufacturing industry can be expected to provide some relief to the problems of rapidly increasing population by creating employment opportunities for the growing urban population. Although manufacturing growth in developing countries is expanding, the fact remains that it is not keeping pace with the growth of urban population. Also, manufacturing employment growth is less than the growth of manufacturing output, implying that the growth of manufacturing, especially capital intensive manufacturing, is not creating sufficient numbers of new jobs to gainfully employ the growing urban population.

The direct role of private foreign investment in labor-intensive industry is likely to be small. Foreign investment has typically been attracted to heavy, capital-intensive industry. Government policy restricting the share of foreign interests in manufacturing industries tend to discourage investment. Other governmental initiatives to promote rural industrialization and, therefore, light, small-scale industry furnish little incentive to foreign investors to expand the manufacturing base in these countries. Additionally, the presence of a labor force characterized by low levels of skills more appropriate to rural agriculture and handicraft industry tends to discourage manufacturing activities which demand relatively more skilled labor. That is, foreign investment, to the extent that it would be attracted to developing countries, cannot be expected to move into those industrial sectors which could absorb the growing population.

The role of private foreign investment in dealing with the population problems of developing countries will be indirect, but vital. Private capital flows to developing countries account for a significant proportion of total foreign capital into these countries. As a result, they expand the financial resources of these countries,

*David J. Cantor, analyst in Energy Economics.

thereby facilitating purchase of capital equipment for light industry and for government projects to overcome the dilemmas of social and economic development. Although private foreign investment may not be significant in directly expanding manufacturing employment, their indirect role can be substantial and, indeed, critical in offsetting the developmental problems of the world's poorer countries.

I. Recent Trends in the Growth of Manufacturing Employment and Output in Developing Countries

Recent trends in manufacturing employment and output in developing countries indicate that the manufacturing sector in these countries has provided only partial relief to their population and, in turn their employment problems generally and to their urban population/employment problems in particular. Data on 24 developing countries compiled by the United Nations Industrial Developing Organization (UNIDO) [29] and the World Bank reveal that manufacturing employment growth was less than the growth of manufacturing output in 16 countries, and less than the growth of urban population in 13 countries. These data are presented in Table 1.

The seriousness of the problem is heightened by the fact that, in 6 of the 13 countries in which urban population growth surpassed manufacturing employment growth, the differential in these two growth rates was 2 or more percentage points. In another 4 countries, the difference was at least 1 percentage point.

The disparities between urban growth and both manufacturing output and employment tend to diminish as income levels increase in these countries. As per capita income increases, urban growth tends to be less than the growth of manufacturing employment. This pattern may be explained in part by the greater potential for industry and industrial sales as income increases. In fact, the average rate of growth of manufacturing output tends to rise as income rises. In the lowest income group of countries (less than $265 per capita income), the average rate of growth of manufacturing output is 5.02 percent and rises to 8.26 percent in the third group (with per capita incomes between $521 and $1,075). The countries with the highest income per capita (greater than $1,075) have a lower growth rate of manufacturing output than the third group, 5.4 percent; however, this rate of growth still exceeds that in the lowest income countries.

TABLE 1.—ANNUAL GROWTH RATES OF URBAN POPULATION, MANUFACTURING EMPLOYMENT, AND MANUFACTURING OUTPUT IN SELECTED DEVELOPING COUNTRIES, BY INCOME CLASS, 1970–78 [1]

[In percent]

Income class country	Urban population	Manufacturing employment	Manufacturing output
Less than $265:			
Ethiopia	6.9	4.0	1.3
India	3.3	2.1	4.6

[29] United Nations Industrial Development Organization, World Industry Since 1960: Progress and Prospects (New York: United Nations, 1979), p. 227. World Bank, World Development Report, 1980, Table 20, p. 148 f.

TABLE 1.—ANNUAL GROWTH RATES OF URBAN POPULATION, MANUFACTURING EMPLOYMENT, AND MANUFACTURING OUTPUT IN SELECTED DEVELOPING COUNTRIES, BY INCOME CLASS, 1970–78 [1]—Continued

[In percent]

Income class country	Urban population	Manufacturing employment	Manufacturing output
Kenya	6.8	6.5	11.7
Malawi	6.2	9.3	6.7
Sierra Leone	5.6	1.3	4.6
Sri Lanka	3.7	−1.4	1.2
$265 to $520:			
Cameroon	7.5	20.0	5.2
Egypt	3.0	3.9	7.6
El Salvador	3.4	5.0	6.1
Nigeria	4.9	8.1	13.4
Philippines	3.6	3.8	6.8
Uganda	7.0	−0.5	−5.0
$521 to $1,075:			
Algeria	6.4	11.5	6.9
Chile	2.4	−0.7	−2.4
Colombia	3.9	3.4	6.2
Dominican Republic	5.3	6.7	7.4
Ecuador	4.5	3.3	10.0
Guatemala	3.7	−3.6	6.1
Korea	4.8	16.8	18.3
Syria	4.7	3.4	13.6
More than $1,075:			
Hong Kong	1.9	1.7	5.6
Jamaica	3.6	3.8	12.3
Panama	3.9	4.1	−0.5
Venezuela	6.4	5.0	4.2

[1] The countries included are those reported by UNIDO, based upon U.N. country studies.

Sources: World Bank, World Development Report 1980. United Nations Industrial Development Organization. World industry Since 1960: Progress and Prospects.

These data suggest that the poorer developing countries, where urban population growth tends to exceed the growth of manufacturing output, will find less relief from the manufacturing sector in terms of both income and employment.

The industries which are absorbing labor in developing countries are typically light industry. UNIDO data indicate that light manufacturing industry (defined as food, beverages and tobacco, textiles, apparel, wood and wood products, rubber products, and plastic products) accounted for 65 percent of total employment in manufacturing in the period 1968 to 1975.[30]

These light industries tend to be labor-intensive. One indicator of the labor-intensity of light industry is its share in total value-added in manufacturing, which is the direct contribution of factors of production to the value of final output. A high share signifies that output is produced mainly with local factors of production. Given that capital equipment is scarce in developing countries, a high share in total value-added implies a large contribution by labor.

World Bank data indicate that, in 38 out of 53 developing countries, food, textile and clothing industries accounted for more than half of total value added in manufacturing in 1976.[31] Furthermore,

[30] UNIDO, op. cit., 238 ff.
[31] World Bank, op. cit., Table 6, pp. 120 f.

in 18 of these countries, these industries represented 75 percent or more of total value-added in manufacturing. These same data indicate that, in only 7 of the 53 countries, the only identifiable heavy industries, machinery, transport equipment, and chemicals, contributed 25 percent or more of value added. Therefore, in only a small number of countries does labor represent a significant contribution to the value of heavy industry.

One factor explaining the relative importance of light labor-intensive industry as an employer in developing countries is the low level of skills present in the population. World Bank data indicate that less than 25 percent of the secondary school age population in lowest income countries (with per capita incomes of less than $360) were enrolled in secondary schools in 1977, and only 4 percent of the age group 20–24 years were enrolled in higher education. In other developing countries, 35 percent of the secondary school age population were enrolled in these schools, and 11 percent of the 20–24 year age group population were enrolled in higher education programs. These data contrast sharply with those of industrialized countries, where 87 percent of the secondary school age population and 36 percent of the 20–24 year age group were enrolled in secondary schools and higher education programs, respectively.[32] That education is not pursued at secondary and higher levels suggests that useful skills for technologically advanced industries are likely to be in short supply.

II. Foreign Direct Investment in the Manufacturing Sector of Developing Countries

Foreign direct investment in developing countries is directed mainly to heavy, capital intensive industry. One study prepared for UNIDO, indicates that a dominant motivation of multinational enterprise in investing in developing countries is to exploit its capability to use high technology; this motivation along with that of market retention ranked highest among 13 identified stimuli to investment. Conversely, the motivation to exploit the relative abundance of labor by setting up labor-intensive methods of production ranked lowest as a stimulus along with the motivations of circumventing trade barriers and of personal relationships.[33] This same study indicates that foreign investment in Indonesia and Thailand was characterized by capital to labor ratios two times greater than investments in industry by developing country entrepreneurs.[34]

III. Industrial Policy in Developing Countries and the Multinational Firm

Two aspects of industrial policy in developing countries deserve consideration in evaluating the role of multinational corporations in these countries. First, the developing countries increasingly are reserving to themselves complete or majority control of many in-

---

[32] World Bank, op. cit., Table 23, pp. 154 f.

[33] O'Brien, P., A Hasnain, and E. Lechurga-Jimenez. "Direct Foreign Investments and Technology Exports Among Developing Countries: An Empirical Analysis of the Prospects for Third World Co-Operation," in Industry 2000: New Perspectives. Volume 3, International Flows of Technology (Vienna: UNIDO, 1979), p. 138.

[34] Ibid., p. 141.

dustries. Second, aware of the problems arising from rapid urbanization, governments have been stressing the promotion of rural industrialization. Both aspects of policy tend to discourage foreign investment. The former policy reduces the influence of the foreign parent corporation in the management of the host developing country establishment. The latter policy would most likely result in small scale, light, labor-intensive industry serving limited markets. These industries are typically not attractive to foreign investors.

Every segment of manufacturing industry (e.g., consumer goods, basic metals and minerals, and capital goods) is receiving high priority for public sector investment in those countries studied by UNIDO. In a survey of 29 countries, 20 governments identified industries in at least two of these sectors for public investment.[35] Although it is not surprising that basic heavy industry would be reserved for the governments, and 27 of the 29 countries surveyed do give priority to these categories of manufacturing in their public investment programs, government's role in investing in light industry is noteworthy. UNIDO speculates that these sectors have not been able to attract private capital or management capability to develop and operate those establishments.[36] If this speculation is indeed fact, the conclusion can be reached that, on the one hand, indigenous private resources are insufficient and, on the other hand, foreign investment is not directed to these light industries.

These data are not to suggest that there is no or even only a small amount of, private enterprise in developing countries. The average share of public sector investment in manufacturing in 20 developing countries was approximately 48 percent in the mid-1970's, according to a UNIDO survey.[37] In Haiti and Korea, the public sector accounted for only 10 percent of total investment in manufacturing. Nevertheless, for those few countries for which prior years' data are available, the trend appears to be in the direction of a larger role for government; government's share of total investment had been rising in six of seven countries for which comparisons can be made. Again, one explanation is government reservation of manufacturing industry to itself.

Rural industrialization is becoming an increasingly significant aspect of social and economic development policy in developing countries. The rapid pace of urban population growth has given rise to social problems of overcrowding, health, and sanitation in the urban centers. Unable to absorb the influx of people to urban centers, governments have determined to introduce manufacturing into rural areas. This policy, if successful, carries with it the implication of small-scale establishments, serving smaller markets. UNIDO asserts that rural industrialization characterized by small scale establishments (employing less than 50 persons) can be a vehicle for absorption of the growing population and providing relief to the problems of the rapid growth in urban centers.[38]

---

[35] UNIDO, World Industry Since 1960: Progress and Prospects, op. cit., Table X. 1, pp. 322 f.
[36] Ibid., p. 321.
[37] Ibid., p. 325.
[38] Ibid., pp. 273 ff.

IV. Conclusions: Implications for Foreign Direct Investment

Despite the policy of governments to reserve certain industries to themselves and to allow only a minority interest to foreign corporations, one should not infer that private foreign investment is not welcome in developing countries. Nor should the inference be drawn that foreign, private investment is not attracted to developing countries. World Bank data indicate that net foreign private investment flows into developing countries had more than tripled between 1970 and 1978.[39] In 1978, foreign private investment amounted to $5.5 billion, as contrasted with $1.6 billion in 1970. This increase represents a 13.3 percent annual rate of growth in private foreign investment. In addition, in 1978, private foreign investment represented 31 percent of total net capital inflows into the developing countries. This share is not insignificant, and reflects clearly that foreign interests are disposed to invest in these countries.[40]

Nevertheless, the trends in industrial development in developing countries, if they persist, indicate that foreign direct investment is not likely to assume a significant role in creating employment opportunities in these countries. The limited evidence indicate that private foreign investment is attracted to heavy, capital-intensive industry. Light industries, which tend to absorb labor, are not being targeted by private capital, foreign or domestic, for investment; they have, in fact, become a priority investment sector for government, according to UNIDO, because of the lack of interest in them by private investors. Heavy industry, including basic metals and capital goods industries, are typically reserved by governments. If foreign investment is not likely to be made in light, labor-intensive industry and can at best only have a minority share of heavy industry, the likelihood of its playing a direct role in the creation of labor-intensive industry is small.

This paper suggests that foreign investment in labor-absorbing industry is unlikely and therefore would not be a major force in creating income-earning opportunities for the growing populations of developing countries. Three principal barriers are present: (1) lack of market potential, (2) lack of requisite skills, and (3) government policy with respect to both host country government/indigenous ownership and rural industrialization. There is little that can be said with respect to the first. The developing countries are caught in what has been called the "vicious circle of poverty."[41] The low level of income in these countries leads to a low level of demand, which in turn, discourages investment and growth of income. If, in fact, the low income of these countries is perceived by

---

[39] World Bank, op. cit., Table 14, pp. 136 f.

[40] The level of per capita income does exert some influence upon foreign investment. A simple regression analysis of the relationship between net foreign investment and per capita income reveals that a $1 increase in per capita income generated a net inflow of over $100,000 in 1978. At least one study supports this thesis that income is a dominant factor in the investment decision. E. Pausenberger, in a study of several German and Swiss firms, concluded that the majority of firms were motivated by the prospects for new markets and for growth of existing markets, both being dependent on income. His sample of firms concentrated their investment in 20 relatively advanced developing countries. See, E. Pausenberger, "The Conduct of International Enterprises in Developing Countries", Intereconomics (November/December 1980), p. 294.

[41] Nurkse, R. Problems of Capital Formation in Underdeveloped Countries. London: Oxford University Press, 1953.

foreign investors to imply a limited potential for market development and growth, and if the latter is the primary stimulus to investment, then one cannot be optimistic about the prospects for foreign or, as UNIDO suggests, indigenous investment in these countries generally.

The second issue, the shortage of requisite skills, requires public policy dedicated to increasing the skill level in these countries. The pattern of industrial development has been in the direction of capital-intensive industry, as evidenced by the considerably higher growth rate of manufacturing output than of manufacturing employment. Capital-intensive industry is likely to attract foreign investment. It is suggested that the low level of skill attainment of the growing labor force is one factor influencing this trend.

The relative scarcity of a skilled labor force is a factor mitigating against a role in job creation for private investment, including foreign investment. Although significant progress may have been made by governments in improving the quality of education and, certainly, in requiring enrollment at the elementary level, a relatively small percentage of the eligible student population enroll in secondary school, and an even smaller percentage enroll in post-secondary education programs. If the type of enterprise which would attract foreign investment does require a variety of skills, the developing countries currently offer limited potential for satisfying this condition. Indeed, the United Nations, which has consistently been supportive of industrial development in these countries, suggests that the participation of government in investment in light industry is the result, in part, of a lack of management skills.

The third issue of government limitations on the share of foreign investment in local industry and the relative emphasis upon rural, small scale industry may also affect the degree to which foreign investment will enter a developing country. On the one hand, foreign investors would be discouraged by the limits on their share of ownership, profits, and control of management. On the other hand, these investors are reticent to invest in small industry.

Despite this pessimism, the argument can be made that foreign corporations can indirectly contribute to the creation of increased employment opportunities by pursuing their present patterns of investment. The barriers to foreign investment have their roots in the general problem of underdevelopment, including a lack of social and economic infrastructure (e.g., roads, schools, housing). Private enterprise cannot be expected to finance the development of this infrastructure. However, to the extent that foreign exchange is needed to install these facilities, foreign investment can be the source of a portion of this foreign exchange. Note that 30 percent of net foreign capital inflows into developing countries in 1978 came from the private sector. To the extent that foreign investment is in extractive and/or export-oriented industries, foreign exchange earnings can be obtained from these ventures possibly to finance social and economic infrastructure. Finally, given the fact that official development assistance is not increasing in relation to donor country GNP, the foreign exchange resulting from private investment and export earnings can be increasingly important to these countries.

The point here is that much remains to be accomplished by government, if private foreign or domestic investment is to be encouraged to assume a direct and significant role in the creation of employment opportunities in developing countries. In the short-term, the role of private investment is likely to be indirect by providing a not insignificant share of foreign exchange earnings. In the longer-run, assuming this foreign exchange is put to use in a way that overcomes the obstacles to foreign investment, a direct role in creating employment to absorb increases in population can be expected.

POPULATION GROWTH, FOREIGN DIRECT INVESTMENT, AND ECONOMIC DEVELOPMENT IN DEVELOPING COUNTRIES: A BRIEF REVIEW OF THEORY*

I. Introduction

In the literature on development economics, three important and recurring issues are: (1) the effects of population growth on economic development; (2) the developmental effects of foreign direct investment in developing countries; and (3) the interrelationships between foreign direct investment (FDI), population growth, and economic development in poorer countries. A considerable number of studies attempting to measure the relationships involved in each issue have been done over the years. The results of these studies tend to vary from developing country to developing country. In some of these countries, population growth has been a spur to development—in others an impediment. Some countries have reaped great economic benefits from foreign direct investment. Others have had much more limited results. Not surprisingly, there are almost as many theories of development and growth as there are variations in the country-study findings. This paper briefly examines the major theories on the developmental implications of population growth and foreign direct investment, and outlines the conditions under which population growth and foreign direct investment can combine to promote economic growth.

II. Definitional and Empirical Background

A. *Developing country.*—In general, a country which has yet to reach the stage of economic development marked by a rate of growth in industrial output and a level of national income sufficient to yield the domestic savings needed to finance additional growth. This does not exclude countries which rely on external resources to foster economic growth. In its "World Development Report, 1980," the International Bank for Reconstruction and Development (or World Bank) divides all lesser-developed countries into two income groups: low-income developing countries with per capita income between $90 and $360 in 1978 (current dollars) and middle-income developing countries with a per capita income range of $390 to $3,500. In 1978, 38 countries belonged to the former grouping and 52 to the latter (which includes all of the so-called "newly industrializing countries").[42]

*Gary Guenther, analyst in Industry Economics.

[42] World Development Report, 1980. The World Bank, Washington, D.C., August 1980, pp. 110–111.

B. *Economic development.*—The process of growth in aggregate and per capita income of less developed countries, accompanied by fundamental changes in the structures of their economies. The main sources of economic development are the size and growth rate of the labor force, the size and growth rate of the capital stock, the rate of technical progress, and the quantity of exploitable natural resources, such as arable land and non-fuel mineral deposits. Economic growth consists of a sustained increase in the output of each worker. Since the natural resource base is given and non-expandable, the productivity of labor will only grow if the capital stock or technical change increases at a faster rate than the labor supply. How large the labor force is and how quickly it expands depend largely on the rate of population growth. Technical progress and capital formation are functions of past and present levels of investment. What portion of national product is invested is strongly associated with levels of domestic per capita saving and the amount of external resources flowing into a country.

C. *Multinational corporation.*—A company or enterprise operating in a number of countries through production or service subsidiaries or affiliates outside the country of its origin. Some usages of the term specify that a company can correctly be designated "multinational" or "transnational" only if a fixed percentage of its sales, shipments, or equity holdings originate outside the company's home country. A common minimum level is 25 percent. The foreign affiliates of a company usually represent discrete profit centers within the overall accounting system of the company. The parent company's influence may be exercised in a wide variety of ways, including control over such strategic aspects of the affiliate's operations as production and pricing policies, choice of technology, appointment of key personnel, and determination of markets—all of which can impinge directly or indirectly on the economic policies being pursued at one time or another by the host country government.[43]

D. *Private foreign direct investment.*—Investment by companies domiciled in one country in companies domiciled in another. The investment can assume one of three forms: a take-over of an existing enterprise in another country, an infusion of capital for a new company, or a joint venture with a new or existing company in the host country. Control of the newly established enterprise is generally retained by the foreign investor. Although control is difficult to define in this context, it is usually both in the form of equity participation and in the form of management of the local subsidiary's operations. Control of equity is assumed to exist when the parent company owns anywhere between 10 and 51 percent of the affiliate's asset value. In surveying foreign direct investment abroad by U.S.-based firms in 1977, for example, the Bureau of Economic analysis of the Commerce Department defined U.S. direct investment abroad as "the ownership or control, directly or indirectly, by one U.S. person of 10 percent or more of the voting securities of an incorporated foreign business enterprise or an equivalent interest in an unincorporated foreign business enterprise." All other

[43] Transnational Corporations and Developing Countries. Committee for Economic Development, Washington, D.C., April 1981, p. 14.

forms of investment were considered "portfolio investment."[44] More specifically, portfolio investment consists mainly of financial outlays by a foreign investor for the acquisition of an existing enterprise without a controlling interest; bank loans in the lender's currency to an existing enterprise; and the purchase of bonds issued by a public authority or by an enterprise in a developing country.[45]

E. *Recent trends in direct investment flows from developed countries to developing countries.*—

Source of foreign direct investment in LDCs.—At the end of 1977, the stock [46] of U.S. foreign direct investment in developing countries was just under $40 billion (current dollars). That represented about 47 percent of the total stock of such investment by all non-Communist industrialized countries. When viewed as a flow,[46] the United States accounted for 42 percent of the annual average foreign direct investment by industrialized countries in developing countries during the years 1972–77.[47] Between 1972 and 1977, direct investment amounted to 28.5 percent of the total net flow of resources from the United States to these countries.

Distribution of U.S. foreign direct investment by host country.—In 1950, 49 percent of the total of U.S. foreign direct investment position was in developing countries, but by 1979 this share had declined sharply to 25 percent. The average annal rate of growth in the stock of U.S. FDI in developing countries between 1950 and 1979 was 7.6 percent.[48] In recent years, the bulk of U.S. foreign direct investment in developing countries has been in Latin America. At the end of 1979, Latin America accounted for 77 percent of the stock of U.S. direct investment in developing countries. And for the years 1973 to 1979, Latin America accounted for slightly more than 83 percent of the annual average flow to these countries from all foreign sources. Of all developing countries, Brazil has by far been the largest host to U.S. foreign direct investment, accounting for almost 16 percent of the total stock in developing countries at year-end 1979.[49] The next largest host country that year was Mexico, with a little more than 9 percent of the stock.

Sectorial distribution of U.S. foreign direct investment in LDC's.—Manufacturing is the most important economic sector for U.S. foreign direct investment in developing countries, accounting for 39 percent of the total stock of such investment at the end of 1977 (current dollars). Finance and trade are the next two most important sectors. Mining and petroleum represented 6 percent and 5 percent (respectively) of the total stock in 1977.[50] During the 1970's, the U.S. direct investment position in the petroleum industry in developing countries declined markedly. This is because fixed investment in petroleum by U.S.-based companies, entered in

---

[44] U.S. Direct Investment Abroad, 1977. Bureau of Economic Analysis, U.S. Department of Commerce, April 1981, p. 2.

[45] Investing in Developing Countries. OECD, Paris, September 1978. p. 6.

[46] Stock refers to the book value of the parent company's holdings of capital stock in their foreign affiliates. Flow refers to the equity and intercompany financial flows from parent company to foreign affiliates.

[47] Committee for Economic Development, op. cit., p. 79.

[48] Whichard, Obie G. Trends in the U.S. Direct Investment Position Abroad, 1950–79. Survey of Current Business, U.S. Department of Commerce, February 1981, p. 41.

[49] Committee for Economic Development, op. cit., p. 81.

[50] Bureau of Economic Analysis, U.S. Department of Commerce, op. cit., p. 195.

official data at historical cost, is now more than offset by the liabilities of certain major U.S. companies to the oil-producing countries for royalties and taxes based on rising crude oil prices. Disinvestment also occurred in this period because oil companies were forced to liquidate equity positions in favor of service contracts and other arrangements.

Income from U.S. foreign direct investment.—Income here consists of interest, dividends, and reinvested earnings of incorporated affiliates of U.S.-based companies, plus the earnings of their unincorporated affiliates. More and more of the income from U.S. foreign direct investment is originating in developed countries. Between 1966–71 and 1978–79 the annual average share from developed countries went from 57 percent of total income to 65 percent. Obviously, the reverse has been occurring in developing countries. When measured in both current and constant 1970 dollars, petroleum has been the biggest source of income on U.S. direct investment in poorer countries. For the years 1978 and 1979, petroleum accounted for 43 percent of total income earned in LDCs (current dollars).[51]

Foreign direct investment and capital formation in developing countries.—Inflows of private capital from advanced industrialized countries have made insubstantial contributions to capital formation in developing countries. In 1978, for example, data published by the World Bank show that for the countries of Brazil, the Philippines, the Ivory Coast, Kenya, Pakistan, Peru, and Malaysia, whose per capita incomes ranged from $230 (Pakistan) to $1,570 (Brazil), net private direct investment, including FDI, accounted for an average of 4.4 percent of gross domestic investment.[52] Had gross private direct investment been compared with gross domestic investment, the average contribution would have been larger but still insignificant.

III. Population Growth and Economic Development

The question of how population growth affects a country's economic development potential can be partially answered by recalling the simple model of economic growth described in the previous section. As growth in the size of the labor force is one of the factors shaping the rate of economic growth, population growth inevitably has an impact on the rate of economic development. Whether this impact is ultimately positive or negative depends critically on how population growth interacts with the rate of technical progress on the one hand and the rate of capital accumulation on the other. On the whole, there are two schools of thought on these interrelationships, namely, the demographic pessimists and the optimists.

The pessimists argue that a country's prospects for economic development are dimmer the faster the rate of population growth. Such a result derives from the fact that the natural resource base of a country is fixed and independent of the size of the country's dependent population and from the unavoidable trade-off between additions to a country's capital stock and total consumption out of

---

[51] Committee For Economic Development, op. cit., p. 84.
[52] World Bank, op. cit., pp. 110–111, 118–119, 138–139.

current income. As the number of children in a population grows, adults find it increasingly difficult to divert enough of current output from consumption to investment to make growth self-sustaining. According to the pessimists, then, population growth in the long run ineluctably causes economic development to slow down because of its depressive effect on the rate of capital formation.[53]

Optimists, on the other hand, view population growth as a spur to economic development *in the long run.* This happens as a result of the positive impact of population growth on the rate of technical progress. A number of premises underlie this conclusion. First, it is argued that people tend to work harder when the size of their families increases. Second, a younger labor force is believed to consume less than an older one. In addition, larger populations are viewed as offering more opportunities for business investment and economies of scale in production. Lastly and most important, population growth is thought to insure that a country's stock of technological knowledge will be ever-expanding. (Research and development is a necessary but not sufficient condition for technical progress.) The combined effect of all these tendencies is to raise the productivity of labor even as the size of the labor force is growing, thereby enhancing a country's long-run development potential.[54]

IV. Foreign Direct Investment and Economic Development

A. MOTIVES FOR FOREIGN DIRECT INVESTMENT IN DEVELOPING COUNTRIES

In general, three types of private foreign direct investment in developing countries can be distinguished. These are export-oriented investment, market-development investment, and government-initiated investment.[55] All three are presumed to occur because the net worth of the foreign investor is greater as a result of achieving a higher rate of return from marginal foreign investment than from a similar domestic investment or because the foreign investor realizes a gain from international risk diversification (in the form of a more stable stream of profits over time) which is unavailable from industrial diversification in a single economy or for both of these reasons.[56] Each type of investment is distinguished by a different set of motivations.

Export-oriented investment typically is undertaken by firms with established domestic and international markets that are seeking new sources of inputs, such as raw materials and component parts, as well as sources of finished products. Key aims for such firms are the acquisition of secondary and more diversified sources of supply and the possibility of obtaining lower-cost products to be used either for further processing abroad or for sale elsewhere. In extractive industries, such as mining and petroleum production, this kind of investment reflects a tend-

---

[53] Coale, Ansley J. Population Growth and Economic Development: The Case of Mexico. Foreign Affairs, January 1978, p. 417.

[54] Simon, Julian. World Population Growth. The Atlantic Monthly, August 1981, 73–74.

[55] Reuber, Grant L. Private Foreign Investment in Development. Oxford University Press, London, 1973, p. 72.

[56] Rugman, Alan M. International Diversification and the Multinational Enterprise. Lexington Books, 1979, p. 7.

ency towards vertical integration on the part of member firms. These firms are mainly interested in extracting minerals (fuel and non-fuel) or agricultural goods, processing them somewhere else, and selling them through established market channels in other countries. In manufacturing industries, this kind of investment can result in the manufacture of component parts in developing countries. A case in point is the electronics industry, where assembly work is done in a labor-intensive manner in countries with comparatively low wage rates and the final products are sold in the home country of the parent company. Foreign firms in these industries usually are seeking to take advantage of the lower labor costs in the host countries to improve their competitive position in other markets.

Market-development investment differs from export-oriented and government-initiated investment in two respects. First, the output of the parent company's foreign subsidiary is sold primarily in the host country. Second, the investment is made primarily in response to such economic factors as the size of the local market, the rate of growth in host-country per capita income, the long-run potential for deepening of the market in the host country, and local factor costs at the margin. This type of investment tends to be profitable only after a long time, so it implies a long-term commitment to the host country. To foreign investors undertaking such projects the long-term growth potential tends to be far more influential in the investment decision than investment incentives offered by the host country government, although industrial development policies which have the effect of erecting barriers in the host country to imports of certain kinds of finished goods can leave foreign companies only with the option of establishing a local subsidiary if they are to have any hope of competing successfully in the local market. Also of importance to foreign investors undertaking this type of investment are the stage of the product cycle they are in, the number of local sellers of the kinds of goods they produce, and the level and target of the foreign direct investment already undertaken by their home market competitors. Some firms are motivated to invest in productive facilities in developing countries by virtue of the decision of competing firms in the home market to undertake a similar investment in the same countries.

Government-initiated investment occurs almost exclusively because of investment subsidies offered by host country governments. In the absence of these inducements, FDI would most likely not take place. Incentives to invest can assume a variety of forms, including import restrictions such as quotas and prohibitive tariffs, preferred access to foreign exchange, tax concessions, direct subsidies and financial assistance, subsidized interest rates on local commercial loans, and factory sites, roads, and other kinds of economic infrastructure constructed at the expense of the government. Investments in LDCs following a program of import-substituting industrialization would fall in this category. This is because the restrictive trade policies and overvalued exchanged rates which are the principal policy instruments used to encourage import substitution leave

foreign companies interested in selling in the local market with no choice but to establish a local subsidiary. Since investments of this general type take place only in response to specific host country government initiatives, they tend to be project-specific, unlike export-oriented and market-development investments which tend to be industry-specific. What investment incentives are offered depends for the most part on the development aims and political orientation of the host country government. These incentives can also play a role in the other two types of FDI, but they are not the *main* motivations for undertaking the investments.

B. THE ECONOMIC CONSEQUENCES OF FOREIGN DIRECT INVESTMENT IN DEVELOPING COUNTRIES

Being a kind of external resource that can supplement or replace domestic savings, private foreign capital inflows can play an influential role in the economic development of poorer countries. Yet, as in the case of the economic effects of population growth, there are optimistic and pessimistic views of the immediate as well as of the enduring economic consequences of foreign direct investment. This section summarizes the major arguments of both sides.[57]

1. *Proponents of FDI.* Foreign direct investment enhances the development potential of recipient countries both in the short and long runs. This enhancement results from a series of interrelated direct and indirect economic benefits. Depending on the economic conditions in the host country before direct foreign involvement, some or all of these benefits could materialize.

The chief *direct* benefits are:

—the addition of capital, technology, and management skills to economies lacking in them;
—access to foreign markets that otherwise would be unavailable;
—an improvement in the balance-of-payments position of the host country by increasing its foreign exchange reserves;
—raising wage and employment levels throughout the host-country economy by directly creating jobs and enhancing the productivity of labor;
—advancing consumer welfare either by making available a better product at a lower cost or by providing products of high quality and low cost never before available.
—The chief *indirect* benefits are:
—the creation of industries supplying inputs to or purchasing for further processing the output of local subsidiaries of foreign firms—so-called "forward and backward linkages";
—the stimulation of investment in other sectors as incomes are raised in the sectors in which multinationals are involved—the "accelerator effect";
—a "multiplier effect" on the economy as a whole, stemming from the increased consumption and saving by laborers employed by the local subsidiary;

---

[57] For a fuller treatment of conflicting views on the economic effects in poorer countries of FDI see Biersteker, Thomas J., *Distortion or Development: Contending Perspectives on the Multinational Corporation.* MIT Press. 1978.

—the dissolution of local monopolies formed before foreign direct investment;

—increased efficiency in the economy through the "demonstration effect" (i.e., the local subsidiary inducing greater productivity in other sectors as other firms seek to emulate the modern production techniques of the local subsidiary) and through the spread of greater skills and technical knowledge among the local labor force.[58]

In the long run, foreign direct investment could have the effect of furthering the integration of the host country into the international economy along the lines of comparative advantage, of promoting greater efficiency in the allocation of domestic resources, and of raising per capita income in the host country higher than it would otherwise have been.

2. *Critics of FDI.* Both in the short and long runs, countries receiving foreign direct investment record more economic losses than gains. This is because, over time, multinationals take out of the host country more resources than they put in. Such a result represents the cumulative impact of a number of discrete economic events, the most important of which are listed below.

The chief *direct* causes of the net resources loss are:

—a worsening of the host country's balance-of-payments position through an excess of capital outflows over capital inflows. The outflows represent profit repatriations by the parent company in the form of dividends, interest payments, royalties for trademarks, payments for administrative services, technical assistance, licenses and patents, and the financing of other foreign transactions;

—the tendency of multinationals to finance a major share of their direct investment by borrowing in local capital markets, thereby "crowding out" other prospective indigenous entrepreneurs;

—the use of transfer pricing to lower illicitly the tax liability of the local subsidiary, thereby reducing the capability of the host country government to finance needed social and economic infrastructure development projects and to achieve such important developmental aims as more equality in the distribution of income or higher levels of employment.

—the tendency of multinationals to confine their selling to local markets. This has the doubly negative effect of driving local competing enterprises out of business and of perpetuating or even exacerbating any foreign exchange constraint on development that may exist.

The main *indirect* causes of the net resource loss are:

—the use of production methods by local subsidiaries that are inappropriate to the factor endowments of the host country. This usually means that multinationals employ capital-intensive techniques in their foreign subsidiaries when capital is relatively scarce and labor (especially unskilled) relatively abundant in the host country;

---

[58] Little and Mirrless. Project Appraisal and Planning for Developing Countries. Basic Books, New York, 1974, p. 119.

—the failure of multinationals to create enough employment opportunities to absorb new entrants into the local labor force;
—a worsening of the distribution of income in the host country because only local upper-income groups are likely to benefit from foreign direct investment;
—the encouragement of consumption habits characteristic of affluent, industrialized, upwardly mobile societies. This use of local resources fails to meet the basic needs of many segments of the local population and is, therefore, wasteful or even baneful.
—the tendency of multinationals to perform almost all research and development in their home countries, thereby hampering or even preventing the technical progress of the host country.

In the long run, foreign direct investment is likely to heighten the economic dependence of the host country on the Western industrialized countries which are the base of operations for nearly all multinationals; to lead a host-country trade posture marked by heavy reliance on exports of primary or semi-finished goods and imports of manufactured goods; and to keep the rate of growth in host-country per capita income beneath what it would be if all development were financed wholly out of internal resources.

3. *Comparing the two views.* Completely assessing the relative merits of the two perspectives on the economic effects in host countries of foreign direct investment would entail using all available empirical evidence along with the appropriate statistical techniques to measure the impact of foreign direct investment on each of the economic variables common to the two perspectives. Such an undertaking is, however, beyond the scope of this paper. Nonetheless, it is possible to point out ways in which the two views are incompatible and to mention what qualifications should guide attempts to determine empirically the strengths and weaknesses of each view.

(a) Incompatibility of the two views

Investment alternatives.—For advocates of each view to make judgments about the economic effects of foreign direct investment in developing countries, they must first specify an alternative against which the consequences of foreign direct investment can be measured. Not unexpectedly, the alternatives specified by the critics and proponents of FDI are diametrically opposed. The former assume that either state agencies or local entrepreneurs are eminently capable of providing the few economic benefits associated with foreign direct investment but at far less cost to the indigenous resource base. FDI has the effect of preempting this indigenous potential. The latter, adopting the opposite extreme, assert that in the absence of foreign direct investment no investment whatsoever would take place in poor host countries.

Level of analysis.—A second aspect of the incompatibility of the two views is the primary level at which each analyzes the net economic effects of foreign direct investment. On the one hand, the proponents focus almost exclusively on the short- and long-run macroeconomic implications of foreign direct investment in developing countries. They endeavor to show how aggregate income, prices, and employment in LDCs tend to respond to the stimulus supplied

by external private capital transfers. Critics, on the other hand, appear to fashion their conclusions around the degree to which foreign direct investment works against the realization of the development objectives of the host country government. These objectives are a blend of macroeconomic, microeconomic, and social desiderata. The critical view, by inveighing against the consumption and external dependence effects of FDI, is arguably more subjective than the proponents' view. Critics, on the whole, apply a much broader framework of analysis to the issue of the economic effects of FDI than that of proponents, a framework which contains a number of nonquantifiable elements. It does not necessarily follow, however, that the view of proponents is superior to that of critics. Both views have merits and flaws. Only a rigorous empirical analysis can determine which view has more of one than the other.

Critical assumptions.—Yet a third area of irreconcilable disagreement concerns the assumptions implicit in each view. These assumptions generally describe the structural features of the economic setting in which the variables that are to be explained operate. The key assumptions of the proponents and critics of FDI are as dissimilar as the alternatives they posit to foreign direct investment. For the former, labor and capital markets in developing countries are assumed to be in competitive equilibrium. This means that the cost of labor truly reflects the value of the additional output resulting from an additional unit of labor, and that interest rates are uniform and reflect real risks of lending. The injection of external capital disturbs that equilibrium, but a new one at a higher level of income inevitably replaces it. The value of the added output from and the added cost of using more labor and capital are equal and remain that way in spite of any and all disturbances.

Critics, however, perform their analysis on the assumption that the economy of the host country is dualistic (i.e., a modern capitalist sector coexisting with a large subsistence sector where the additional output of another laborer approaches zero) and that product and labor/capital markets are imperfect. Examples of such imperfection are the existence of monopolies in commodity markets, great wage differentials for unskilled labor in the modern and subsistence sectors, and wide ranges of interest rates in local capital markets.[59] Foreign investors, critics contend, only exacerbate these imperfections and disequilibria by performing research and development elsewhere, paying higher wages than indigenous firms in other sectors, creating few jobs, and financing their directly productive investments in local capital markets, to the detriment of the host country.

(b) Qualifying considerations for evaluating the two views

In evaluating empirically the arguments made by both schools concerning the net impact of foreign direct investment on the balance-of-payments position of and level of employment in the host country, certain qualifying considerations should be recognized.

Balance of payments.—Critics of foreign direct investment, it will be recalled, contend that such investment invariably results in a

[59] Little and Mirrless, op. cit., p. 30–32.

net capital outflow from the host country. The opposite conclusion is reached by proponents. Any attempt to measure the balance-of-payments effects of directly productive capital flows between two or more countries should take explicit account of the fact that capital flows make up only one item of a country's balance of payments. Trade in goods and services also must be included. Over time, the value of any exports from the local subsidiary along with the value of the imports saved by the output of the local subsidiary for domestic consumption may exceed any surplus of profit remittances over capital inflows. If this were to occur, the balance-of-payments position of the host country would most likely be strengthened. Moreover, the outflow of profits from a host country is logically unrelated to the inflow of capital in the same year. Rather, profit remittances reflect direct investments undertaken in previous years.[60]

Employment creation.—The issue of the appropriateness of the technology brought into developing countries by foreign enterprises is another way of addressing the net employment effect of foreign direct investment. In measuring this effect, both the *externalities* of foreign direct investment and the relevant *economic policies* of the host country government are extremely important. (Externalities here are those economic effects of foreign direct investment that are not reflected in calculations based on the cost of inputs to and the prices of outputs from the local subsidiary such as multiplier and accelerator effects.) One key externality would be the creation of indigenous firms either selling to or purchasing from the local subsidiary. Another would be the expansion of sectors of the local economy because the foreign enterprise invested in a bottleneck sector, relieving chronic shortages of certain commodities. In both instances, employment in the affected industries would probably grow but not necessarily in a way that would reduce levels of unemployment and underemployment in the local economy.

Host country governments can significantly influence the choice of production techniques by foreign firms investing in the local economy. These techniques, in turn, can determine whether the local economy will register a net employment gain from foreign involvement. The influence tends to be strongest when governments in developing countries seek to stimulate industrial growth through suboptimal trade strategies.[61]

One such strategy is import substitution; another export promotion. Both engender distortions in factor and commodity markets: these include import duties, quotas protecting domestic industries, overvalued exchange rates, and various export subsidies. By allocating capital goods import licenses and keeping the exchange rate of the domestic currency so artificially high that the cost of imported capital is considerably below its actual domestic marginal or replacement cost, a host country government can implicitly subsidize the use of capital-intensive techniques by those who get licenses, such as foreign entrepreneurs. Capital-intensive techniques also

---

[60] Frank, Isaiah. Foreign Enterprise in Developing Countries. Johns Hopkins University Press, Baltimore, Maryland, 1980, p. 30.

[61] Krueger, Anne O., ed. Trade and Development in Developing Countries: Part I-Individual Country Studies. University of Chicago Press, Chicago, 1981, p. 12–13.

can appear more competitive with labor-intensive ones when foreign investors can borrow in local capital markets at lower interest rates than indigenous entrepreneurs. Lastly, government-enforced minimum wage and employment laws can encourage multinationals to employ in capital-intensive production methods their local subsidiaries, despite the relative abundance of labor in many developing countries.[61]

V. Summary and Conclusions

A number of conclusions can be drawn from the preceding discussions.

1. *The development role of foreign direct investment.*—Economic development is a cumulative process of economic growth and structural transformation. In general, the higher the level of investment, the greater the rate of capital formation and technical progress and thus the faster the rate of economic growth. Investment can be financed either out of domestic savings, or, if that proves unmanageable or impossible, through inflows of external resources. Foreign direct investment can help bridge any resource gaps which may exist in the host country. It usually comprises a uniform bundle of capital, technology, and entrepreneurship. To the extent it stimulates exports or replaces imports with domestically produced goods, foreign direct investment can loosen, if not eliminate, any foreign exchange constraints of growth. But rapid economic growth may be only one of several development objectives for the host country. Others may include increased economic independence, higher levels of employment, and a more equitable distribution of income. The implications of FDI for the pursuit of these aims seem much more problematic.

2. *Foreign direct investment and population growth.*—Population growth will not depress per capita income if population growth and capital accumulation or population growth and technical progress is positively related. If foreign direct investment occurs in sectors with relatively high levels of productivity, and domestic resources, in response, shift to these sectors from less productive ones, then the total national product will be greater. If the rate of increase in the national product exceeds the rate of population growth, then per capita income also will rise.[62] Moreover, the growth in per capita income could become self-reinforcing. This is because two of the determinants of foreign direct investment are per capita income level and the size of the market. Once both start to grow, additional foreign direct investment may be forthcoming. Data published by the World Bank show a strong positive correlation between level of per capita income and the amount of net foreign direct investment and a somewhat weaker positive correlation between population growth and the amount of net foreign direct investment.[63] None of this, however, necessarily means that the

---

[62] Hagen, Everett E. The Economics of Development. Richard D. Irwin, Inc. Homewood, Illinois, 1975, p. 204.

[63] See World Bank, op. cit., Tables 14 and 17, p. 136–7, and by industry, p. 142–4.

total demand for labor in the host country would increase proportionately.

3. *Foreign direct investment and employment creation.*—To reduce unemployment in a developing country, the rate of increase in labor demand must be greater than the rate of addition to the labor supply, which depends critically on the population growth rate. Foreign direct investment can help insure that the former is in fact higher than the latter in the short run. For this to happen subsidiaries in developing countries of foreign enterprises would have to rely heavily on labor-intensive production processes.

Up to now, such production methods have mainly been used in light manufacturing industries (e.g., electronics and textiles).[64] This, however, is not entirely the result of decisions made by multinationals. The economic policies of the host government can influence the foreign company's decision on production methods. Minimum wage and employment laws and deliberately overvalued exchange rates can implicitly subsidize capital-intensive techniques. In addition, a foreign investor ostensibly establishes a subsidiary in a developing country in order to raise its overall profitability. In some industries, capital-intensive production techniques are the only feasible means to this end. Two such industries are mining and petroleum. Very few linkages to the rest of the local economy typically result from foreign direct investments in these industries.

Thus the employment effects of FDI depend on host government economic policies, the motives of the foreign investor, and the sectors at which the investment is targeted. If more employment in developing countries is to be created by foreign direct investment, foreign enterprises will have to devote more research to adapting their production techniques to the factor endowments of these countries, and host country governments will have to eschew economic policies that effectively subsidize the use of capital-intensive production methods where capital is relatively scarce, and that promote industry at the expense of agriculture, a sector well-suited to labor-intensive techniques.

---

[64] Comparing the ranking of the employment by industry of affiliates in developing countries of U.S.-based multinationals with the affiliates' ranking by direct investment position by industry at the end of 1976 yields a correlation coefficient of .091. Though positive, the coefficient is notably weak. This strongly suggests but does not prove that the industries in developing countries which have benefited most from direct investment by U.S.-based multinationals have experienced the least employment growth. See Tables II. G.4 and II. W.3 in "U.S. Direct Investment Abroad, 1977," Department of Commerce, April 1981.

POPULATION GROWTH AND FOOD AVAILABILITY IN DEVELOPING NATIONS*

Introduction

Food production in developing countries grew 2.4 percent in 1980 and at an annual rate of 2.8 percent between 1976 and 1980. But on a per capita basis food production in developing countries rose by only 0.2 percent in 1980 and at an annual rate of 0.6 percent between 1976 and 1980.[65] Minimum levels of caloric consumption are not being met now in a number of these countries and the situation is expected to worsen, particularly in Africa, by the end of the century. Growth of developing nations' agricultural sectors is necessary not only to meet the food needs of the approximately 800 million people who live in rural areas and make their living from agriculture, but also to meet the rising demand for food resulting from the growth in population and incomes.

This paper—within the limits imposed by data that is sometimes incomplete—outlines current food and calorie availabilities in developing countries and makes limited projections for the year 2000. Some discussion of the implications of development of agricultural sectors is also included.

World Food Production

The table on the following page provides indices of total and per capita world food production by region for the years 1950–80. As indices of food rather than agricultural production, the information in the table excludes data on inedible fiber and noncaloric products. World food production has continued to increase in both the developed and developing nations; production is actually increasing faster in the developing countries. On a per capita basis, world food production is also increasing but at a slower rate; however, for the developing nations as a group, per capita production has actually been declining in the past few years. Regionally, the most significant per capita declines have occurred in Africa and South Asia.

TABLE 1.—INDICES OF FOOD PRODUCTION 1950–80

Year	Developed world	LDC's	South and Central America	Asia			Africa	World
				East	South	West		
1951:								
Total	64	56	52	50	57	52	63	58
Per capita	79	86	87	78	83	87	101	82

*A. Ellen Terpstra, analyst in Agricultural Policy.

[65] The World Food Council. "The Current World Food Situation." May 1981, p. 4.

TABLE 1.—INDICES OF FOOD PRODUCTION 1950–80—Continued

Year	Developed world	LDC's	South and Central America	Asia			Africa	World
				East	South	West		
1955:								
Total	73	64	60	61	65	63	69	67
Per capita	87	92	90	87	90	95	101	89
1960:								
Total	83	75	68	71	77	74	80	78
Per capita	92	95	89	91	96	97	104	95
1965:								
Total	90	84	85	84	80	86	87	86
Per capita	95	95	97	94	90	98	100	95
1970:								
Total	98	101	102	101	102	100	99	100
Per capita	98	101	102	101	102	100	99	100
1975:								
Total	109	116	120	123	113	125	108	111
Per capita	104	103	105	110	101	109	94	101
1980:								
Total	118	129	143	141	120	144	113	120
Per capita	109	101	110	113	97	110	85	100

Source: Derived from World Indices of Food Production and World Indices of Food Production Per Capita, "World Indices of Agriculture and Food Production," U.S. Department of Agriculture, Economic Research Service, July 1981. World figures do not include The People's Republic of China; East Asia figures exclude Japan; and Africa figures exclude South Africa.

The World Food Council states that during the 1970's food production per capita in the developing countries increased at only half the rate of the increase in population and that in 61 countries, food production actually decreased. Another analysis points out that while per capita production in the developing countries as a group has increased, the number of individual developing countries in which per capita production did not rise, has grown: "During the 1960's, per capita food production declined in 56 out of 128 LDCs. During the 1970's this number rose to 69 countries and came to include the highly populated nations of India, Pakistan, Mexico, and Egypt. . . ." [66]

Calorie Distribution

In its *"World Development Report, 1980"*, the World Bank notes, "At the global level, if income were distributed differently, present output of grain alone could supply every man, woman and child with more than 3,000 calories and 65 grams of protein per day—far more than the highest estimates of requirements. Eliminating malnutrition would require redirecting only about 2 percent of the world's grain output to the mouths that need it." [67] This is not to suggest that redistribution is the solution to global food problems, rather this quote is used to demonstrate the world food production and consumption relationship.

While it is generally agreed that enough food is produced globally to meet per capita needs, per capita calorie consumption is unevenly distributed. Currently, North Americans, Western Europeans, Japanese, Australians, and inhabitants of Eastern bloc coun-

[66] Murdoch, William W. *The Poverty of Nations.* The Johns Hopkins University Press, Baltimore, 1980 p. 108.

[67] The World Bank. *"World Development Report, 1980."* The International Bank for Reconstruction and Development/The World Bank, Washington, D.C., 1980, p. 61.

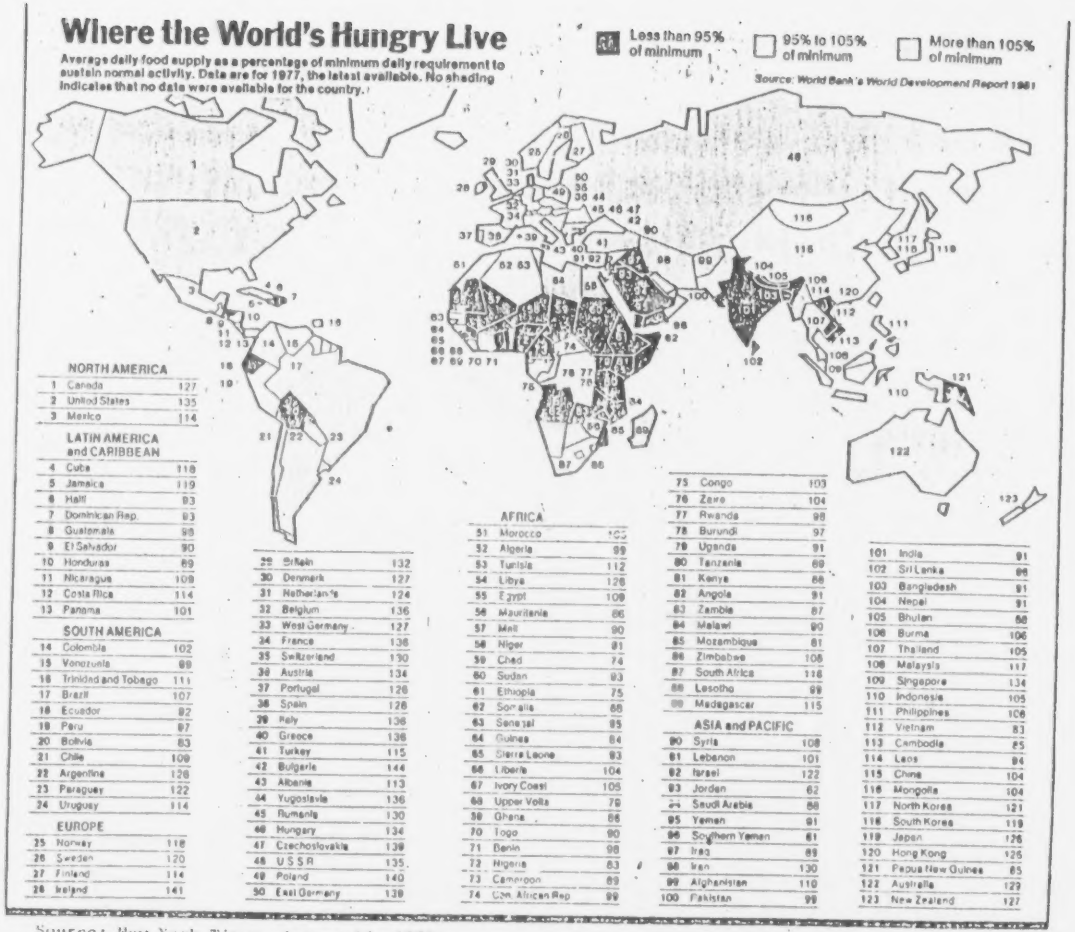
tries consume about 1,470 pounds of grain equivalent or about 6,400 calories per day per person. People in the poorest developing countries consume about 400 pounds of grain equivalent or roughly 1,750 calories per day per person. Those in better off-developing countries eat nearly 530 pounds of grain equivalent or 2,300 calories per day per person.[68]

Satisfaction of Minimum Daily Requirements

A second approach to viewing the world food and population relationship is examining the adequacy of food intake averages by nation. The Food and Agriculture Organization (FAO) calculates minimum levels of food intake that are necessary to allow normal activity and good health in adults and to permit children to reach their potential body weight in the absense of disease. An FAO official recently noted that "there was a rather steady improvement from 1969–71 to 1980—with supplies rising from under 94 to just over 100 percent of requirements. For Africa and Asia, however, the ratio was practically stagnant with supplies remaining some 6 or 7 percent below requirements, while ratios remained favorable in Latin America and improved dramatically in the Near East." [69] The map on the following page presents the World Bank's estimate of each nation's average daily food intake as a percentage of minimum daily requirements to sustain normal activity.

[68] Hopper, W. David. "Recent Trends in World Food and Population." In Future Dimensions of World Food and Population, Richard G. Woods, Editor, Westview Press, Boulder, 1981, p. 36.
[69] Kimmel, Donald C. "Food—Supply and Prices: Who's Winning?" NEC Abstracts, Washington, D.C., July 23, 1981, p.1.

BEST COPY AVAILABLE



Source: New York Times, August 16, 1981.

Implications of Chronic Undernutrition

Global or country averages by their nature mask the number of individuals suffering from chronic undernutrition. Nearly one-half billion people are estimated to be undernourished. In general, undernutrition results from a shortage of food rather than an imbalance between protein and calories. One source estimates that "two-thirds of these malnourished people are on the land or in the villages of developing countries. Each year between 13 and 15 million children in those countries die unnecessarily from the combined effects of malnutrition and the diseases to which it makes them especially vulnerable." [70]

Those who are malnourished may be so as a result of a number of circumstances: cultural or social status; nutrition ignorance; inadequate food supplies due to production shortfalls, transportation and communication hinderance to food distribution, and the cyclical nature of local food supplies; inadequate purchasing power; and, lack of foreign exchange available to purchase imports. Another researcher comments, "There may often be shortages of specific micronutrients and of protein, especially among young children. But given the typical composition of the diets of the poor, to the extent that calorie requirements (as estimated by the FAO and WHO [the World Health Organization) are met, it is likely that other nutritional needs will also be satisfied. . . . Malnutrition is estimated to be a contributory cause of a third or more infant and child deaths in developing countries." [71] Another source notes "over half of the world's malnourished people are children under the age of five." [72] Other particularly vulnerable groups include pregnant and lactating women and those family members who for cultural or social reasons are not as highly valued and therefore are the first to suffer the effects of a food shortage.

As a result of nutritional deficiencies, a child may have limited intellectual and physical capabilities if childhood is survived, and be more susceptable to disease. One analyst summarized: "Because nutrition status affects health, labor productivity, learning capacity, and thus income, malnutrition also has significant implications for economic development as well as for population growth. It is estimated that roughly 1,130 million or 74 percent of the developing world's population in 1965 consumed below the minimum FAO-WHO daily calorie requirements. . . ; recent projections for 1975 show a potential deficit for somewhere between 1,073 and 1,373 million people, or 55 to 71 percent of developing country populations. . . ." [73]

Food Imports

While 90 percent of the grain consumed in developing countries is produced indigenously, the FAO food self-sufficiency ratio for de-

---

[70] McLaughlin, Martin M. "The World Hunger Situation." Testimony before the House Committee on Agriculture. U.S. Congress. House. Committee on Agriculture. World Hunger Situation. Hearings, 97th Cong., 1st Sess., July 21, 22, and 23, 1981. Washington, U.S. Government Printing Office, 1981. P. 137. (Hereafter cited as World Hunger.)

[71] Op. cit., The World Bank, p. 59-60.

[72] McPherson, M. Peter. Op. cit., World Hunger, p. 290.

[73] Leipziger, Danny M. *Basic Needs and Development.* Oelgeschlager, Gunn, and Hain, Publishers, Inc., Cambridge, 1981, p. 56.

veloping countries as a group has fallen from 93 percent in 1973 to 87 in 1981, and is anticipated to fall to 74 by 2000. The areas of Africa and the Near East are expected to suffer the biggest declines. The food deficit of developing nations was about 37 million metric tons in 1975 and is expected to be over 90 million metric tons in 1981. The International Food Policy Research Institute projected in 1977 that shortfalls would reach 120 to 145 million metric tons by 1990 and mostly occur in countries with GNPs of less than $300 (in 1975 terms) and high population growth rates. A second study described the future in the following way:

> The most recent projections are that the total deficit of staple food crops in the non-Communist LDCs in 1990 will be 120 to 140 million tons. This deficit would be made up of 40 percent in Asia, 25 percent in North Africa and the Middle East, over 20 percent in Sub-Saharan Africa, and over 10 percent in Latin America. The most severe problem is projected for the poorest LDCs—those with per capita GNP in 1973 of less than $300. This group of nations has two thirds of the total population of the non-Communist LDCs; 75 percent of them live in Asia. Their aggregate food deficit is projected to increase from 12 million tons in 1975 to between 70 and 85 million tons in 1990, which would cost $10.5 to $12.5 billion at prices prevailing in the late 1970's. Simply to maintain 1975 levels of per capita consumption in 1990 would require 35 million tons more than projected production.[74]

Another source notes that food exports to low-income countries are anticipated to increase 17 percent in 1981 and elaborates, "Even though the food share of developing countries' import bill has steadily declined (because other prices rose more rapidly) the total value has increased about 12 percent per year since 1967—with cereals accounting for about half that total. Increased volume represented only one seventh of the value of the increase; prices doubled and freight rates increased fourfold during the period."[75]

The United States as a Food Exporter

World food imports increased tremendously during the 1970's and the United States increased agricultural production to meet this demand. U.S. grain exports supplied nearly 90 percent of the doubled demand for all grains and 44 percent of the increased demand for cereal grain. A U.S. Department of Agriculture analyst projects that "By 1985, the world outside the United States will depend on imports from the United States for 15 percent of its agricultural supplies, compared with 2 percent in the early fifties and 11 percent in the late seventies."[76]

About half of the increase in grain demand came from the developing countries, mostly those which export oil or are industrialized. One trade analyst comments on the increased demand from the low-income developing countries: "In general, this group is charac-

---

[74] Op. cit., Murdoch, p. 110.
[75] Op. cit., World Hunger, p. 143.
[76] O'Brien, Patrick M. "Global Prospects for Agriculture." In "Agricultural-Food Policy Review: Perspectives for the 1980's. U.S. Department of Agriculture, Washington, D.C., April 1981, p. 14.

terized by very low rates of economic growth—1 percent per capita or less—a low level of exports and low rates of export growth. As a result, even the modest grain imports of these countries represent a greater burden (10 percent of export earnings as compared with 4 percent for the middle-income oil and food importing group)."[77]

The United States today is the largest exporter of cereal grains "accounting for 60 percent of total world trade in 1980–81. The 40 percent of these exports that go to the developing countries constitute nearly two-thirds of the latter's imports."[78] The United States is also the largest donor of food aid, contributing about 5 million tons annually. Such aid from all sources currently amounts to about 9 million tons per year. This represents about 2 percent of consumption in non-Communist poor nations[79] and covers approximately 20 percent of the cereal import needs of the low-income countries.[80]

This rising dependence on imports for basic food and feed commodities raises some concerns as developing nations maintain policies which promote investment in crops which will be exported while not adequately instituting programs which provide for fair agricultural prices to stimulate indigenous production of food crops or for the development of a sufficient agricultural infrastructure and input system. As a result, agricultural development stagnates, foreign exchange is expended, and countries are vulnerable to fluctuations in world prices.

The following table demonstrates the changing pattern of world grain trade. Its author points out "Had North America's 1950 population expanded at 3 percent per year, it would have reached 395 million in 1980 (rather than the actual 248 million) and absorbed virtually all the region's exportable surplus . . . ."[81]

Table 2.—THE CHANGING PATTERN OF WORLD GRAIN TRADE [1]

[Million metric tons]

Region	1934–38	1948–52	1960	1970	1980
North America	+5	+23	+39	+56	+131
Latin America	+9	+1	0	+4	−10
Western Europe	−24	−22	−30	−30	−16
Eastern Europe and U.S.S.R.	+5	0	0	0	−46
Africa	+1	0	−2	−5	−15
Asia	+2	−6	−17	−37	−63
Australia and New Zealand	+3	+3	+6	+12	+19

[1] Plus sign indicates net exports; minus sign, net imports.

Source: Food and Agriculture Organization, U.S. Department of Agriculture, and author's estimates. Lester R. Brown. "Building A Sustainable Society." W. W. Norton and Company, New York, 1981.

Food Demand and Income Changes

Estimates of the rate of growth for food demand vary depending on what assumptions are made with regard to population growth

[77] Sanderson, Fred H. "The Role of International Trade in Solving the Food Problems of the Developing Countries." Op. Cit., World Hunger, p. 179.
[78] Op. Cit., World Hunger, p. 146.
[79] Op. Cit., Murdoch, p. 102.
[80] Op. Cit., The World Food Council, p. 15.
[81] Brown, Lester R. World Hunger, p. 359.

and increases in income. One analyst notes, "Essentially what is causing the food problem in developing countries has been the rate of increase in the demand for food—which is a combination of a high rate of population growth, averaging 2.5 percent annually, and a high income elasticity [82] of demand for food. The combined effect was to raise food demand by 3.3 percent annually—while food production in developing countries has been increasing at 2.6 percent annually—over the period 1950–75." [83]

A number of studies have found that demand for food increases about half as much as incomes increase: "[one study] yields an income elasticity of food expenditure (the percentage change in the amount of food purchased for a percentage increase in income) of .496, implying that food expenditures do not increase equiproportionally with income." [84] A second analysis notes that elasticities vary due to cultural, taste, and dietary differences but that the elasticity for cereals is about 0.5 in low-income countries and 0.1 in higher-income countries.[85] This analyst additionally makes projections for future estimates of demand for food:

> . . . As the world's total economic product increases at about 3.4 percent per year, and per capita income at the rate of about 2.5 percent (weighing growth by income level on a global basis), there will be a significant opportunity for consumers to expand food consumption through an increase in personal purchasing power. In low-income countries, that is, those with per capita gross national product of $250 or less, the annual growth of national product is about one percent per year. These countries will add about 0.5 percent per year to the demand growth for food which is generated by a population expansion of approximately 2.4 percent, therefore giving an annual increase in cereal requirements of roughly 2.9 percent. In the middle- and low-income countries, where per capita incomes vary between $250 and $1,000 per capita, individual income is growing at a rate of 2.4 percent per year adding about 0.55 percent to the population growth rate of 2.6 percent for a needed annual food increase of 3.15 percent. In the countries from $1,000 to $3,000 per capita income, the economic growth rate is approximately 4.8 percent per year, and the demand growth for food due to this increasing affluence will be approximately 0.6 to 0.7 percent. The growth rate, combined with increments to population, would necessitate an expansion in food availability of 2.9 to 3.0 percent annually. . . . In all, the demand for food in a global basis can be expected to increase at close to 3.0 percent per year, approximately four-fifths of which is population expansion with the remainder due to income growth. A growth of 3.0 percent per year implies a doubling of food requirements in twenty-four years. Holding the present

---

[82] High income elasticity means that as incomes increase a large proportion of that increase will go to food purchases.

[83] Williams, Maurice J. "The Nature of the World Food and Population Problem." In Woods, Op. Cit., p. 13–14.

[84] Op. Cit., Leipziger, p. 64.

[85] Op. Cit., Woods, p. 38.

pattern of food distribution constant, and assuming a continuation of present population and economic expansion growth rates, there will be a world food need of approximately 3.0 billion metric tons of grain by the turn of the century.[86]

Per Capita Food Availability in 2000

In 1980, the U.S. Government released "The Global 2000 Report to the President of the United States: Entering the 21st Century" which contained projections of per capita food availability for that year. Per capita food consumption in LDCs as a group is expected to increase by 9 percent. Average caloric consumption is projected to be 20 percent or more above FAO minimum standards in Latin America; 6 to 17 percent above in East Asia, Southeast Asia, and affluent areas of North Africa and the Middle East; 3 percent below in South Asia; and 20 percent below in Central Africa, if severe drought does not reoccur. The study points out that because income and food distribution within individual LDCs is so skewed, national caloric consumption levels must be 10 to 20 percent above the minimum standard so that the diets of the poorest are likely to be adequate.[87]

Economic Implications of Agricultural Production

Growth of the agricultural sector has significant implications for a nation's overall economic well-being. First, a large number of the poorest people in developing nations, perhaps 800 million, live in rural areas and base their economic livelihood in agriculture. An increasingly productive agricultural sector is needed to meet the rising urban demand for food as their incomes increase. Without growth in production, food prices would rise, leading to demands for wage increases and reduced growth of manufacturing. A prospering agricultural sector will allow surplus capital to be transferred through savings, taxation, and other means for use in industrial development. Growth in the agricultural sector may benefit the economy if increased production of exportable commodities will result in foreign exchange being earned and/or if increased production of staple food which had previously been imported, will result in saving foreign exchange. As the agricultural sector prospers, additional demand for producer and consumer goods is generated, stimulating other sectors.[88]

In another study, the International Food Policy Research Institute makes a number of points about the impact on the agricultural sector of economic growth in nonagricultural sectors. The Institute notes that in a developing economy with capital formation and technological change occurring rapidly in the nonagricultural sector, a difficult-to-match growth in demand for food takes place. To sustain the growth momentum, rapid technological change will have to occur in the agricultural sector. In order to avoid the impoverishing effect of a rise in food prices, efforts should be under-

---

[86] Op. Cit., Woods, p. 38–9.
[87] Barney, Gerald O. "The Global 2000 Report to the President of the United States: Entering the 21st Century." Pergamon Press, New York, 1980, p. 17.
[88] Op. Cit., Murdoch, p. 172–3.

taken to expand employment, accelerate domestic agricultural production, and increase foreign exchange expenditures for food imports. The Institute also notes some effects of rapid population growth which "tends to decrease labor productivity in agriculture, reduce the pace of transformation of the economy from agricultural to nonagricultural, and hence to discourage growth in per capita incomes, in food intake, and in nutritional status." [89]

Summary

From the preceeding discussion, it is evident that per capita demand for food in developing countries will continue to outpace per capita production of food; in addition, there is a tremendous gap between the real and potential demand for food if one takes into account those with no purchasing power, those consuming below minimum requirements, and those eager to consume more poultry, beef, and luxury commodities. Rapid population growth in developing countries also may decrease a nation's nutritional status, cause food prices to rise, and increase food import expenditures.

Multinational corporations are already heavily involved in the business of the grain trade, the manufacture and distribution of food, and the development of agriculture in Third World nations. The projections of increased food demand resulting from increasing population and incomes raises a number of questions about what the role of multinationals might be in the future.

The United States is expected to continue to increase production to meet the rising world demand for food. Questions are being raised as to whether this is a healthy long-term policy for the United States. Is the United States in effect, exporting a vital resource, topsoil? What impact does increased foreign demand have on the competing but domestic uses for land, inputs, and credit? Will U.S. consumers call for "reasonable" food prices and want foreign demand curtailed?

Does U.S. policy encourage developing countries to emphasize indigenous production and development of a healthy agricultural sector and its infrastructural requirements?

Do Third World nations adopt investment policies which encourage multinationals to assist them in the development of their agricultural sector?

THE EFFECTS OF OVERPOPULATION ON GOVERNMENT PROGRAMS IN DEVELOPING COUNTRIES*

As the population of the world grows amid an environment of poverty and economic stagnation, concern is increasing over the possible effects of this population growth on the future economic policies of developing nations, and the allocation of their limited financial resources. Within the past decade, populations in many developing countries have been growing so fast that their governments have been unable to respond to increased demands on already overburdened educational, health, sanitation, transport, and other public services.[90]

According to U.N. estimates, 20 years from now some 40 cities in developing countries may contain more than 5 million inhabitants each; half of these may have over 10 million, including Mexico City at 32 million; Sao Paulo 26 million; Calcutta 20 million; Bombay 19 million; and Karachi 16 million. By the year 2000, three-fourths of the population of Latin America will be living in cities. As Ambassador Richard Benedick, Coordinator of Population Affairs, Department of State, has pointed out, "provision of jobs, housing, and social services to numbers of this magnitude over such a short period of time, will present difficulties hitherto unimagined by town planners and governments."[91]

In planning government policies, countries divide expenditures between those on human development (health, education, sanitation, and other public services) and economic development (road building, transportation, energy, etc.), for some, one kind of development may be favored at the expense of the other.

These problems will be of particular concern to multinationals and other foreign firms in planning where and how they will invest in developing countries and in anticipating the problems they must face in terms of political climate, country stability, manpower, and economic infrastructure.

Over the years, and particularly since the U.N. World Population Conference in Bucharest in 1974, there has been increasing awareness by the majority of developing countries concerning the economic and social consequences of overpopulation. An increasing number are incorporating population considerations into their overall development plans. Of the 158 developing countries which

*Marion M. Montague, analyst in U.S. Foreign Policy.

[90] World population: Silent Explosion. Department of State Bulletin [reprint], Fall 1978. Washington, U.S. Government Printing Office, 1978, p. 18. (Department of State Publication 8956.)

[91] U.S. Congress. Senate. Committee on Foreign Relations. World Population Trends. Hearings, 96th Congress, 2d session, on U.S. Population Policy and Programs, April 29 and June 5, 1980. Washington, U.S. Government Printing Office, 1980, p. 68.

responded to the United Nations Fourth Inquiry of Member Governments, all but 40 were advocates of family planning. To this end many have established population units in their ministries of planning, and have endeavored to develop improved statistics and research in relation to their population programs.[92]

Data developed in 1979, indicates impressive fertility declines in a number of countries including China, Indonesia, Thailand, Colombia, and Mexico. This was true even among poor, illiterate and rural populations of varying ethnic and religious backgrounds.

The keys to these successes apparently included commitment of government leadership, effective delivery of family planning information and services, local community involvement, and enhanced status of women including educational and employment opportunities. Improvements in health and economic conditions as well as hope for future progress appear to favor a movement toward smaller families. In a growing number of countries—China, Singapore and Thailand—economic incentives and disincentives have contributed substantially toward reducing family size.[93]

Despite these apparent successes, and the obvious importance of factoring population considerations into government economic policy, population policy is not a dominant theme in international relations. Ambassador Benedick pointed out in testimony before Congress that:

> By the world's actions, by its relative budget priorities, and by its silence, it would seem that even now, many would prefer not to agree with World Bank President Robert McNamara that, "short of nuclear war itself, population growth is the gravest issue that the world faces over the decades immediately ahead." Public attitudes toward population lack a sense of urgency, even though the gradual and accumulating effects of population growth threaten to undermine efforts to solve a broad range of problems.[94]

Currently, many countries of South Asia and the Middle East—India, Pakistan, Bangladesh, Egypt, Jordan, Iran, and Turkey—and many smaller countries in Latin America are making only limited progress in slowing population growth. And many countries of Africa have not yet recognized the need for controlling population growth.

Even with regard to those countries that are now being seen as successes, there are observers who believe that their current situation merely represents the easy phase.[95] They maintain that reducing fertility to replacement levels, will require considerably more intensive and expensive efforts in terms of education, motivation, and expansion services.[96]

Among the many constraints to effective population programs are uneven commitments of political leadership, limited administrative ability, and logistical difficulties. There is a need for a vari-

---

[92] United Nations Fund for Population Activities, Newsletter. Vol. 7, No. 7, July 1981, p. 2.
[93] World Population Trends, hearings, p. 35, statement by Dr. George F. Brown, Vice President and Director of International Programs of the Population Council.
[94] Ibid., p. 70, statement by Ambassador Richard Elliot Benedick, Coordinator of Population Affairs.
[95] Footnote omitted by author.
[96] Ibid.

ety of expertise: demographers, sociologists, economists, political scientists, social psychologists, anthropologists, and statisticians who can address a chain of multiple questions: "What is, to what consequence, for what reasons, how and at what costs can this be changed, and with what further consequences?" [97]

Rafael M. Salas, Executive Director of the United Nations Fund for Population Activities, in a statement before the United Nations Conference on Human Settlements in Vancouver, Canada in 1976, noted that population programs of whatever kind had been proved most effective when coupled with the concern and involvement of the community. Management of this kind of development requires a special expertise; it requires the establishment of an administration which is "flexible and sensitive" enough to respond to local and individual needs while carrying out the purposes of the broader plan. Above all it requires, he added, willingness from the political leadership to the lowest administrative level, to go through the long, slow, and at times painful processes of gaining and implementing consent.[98]

In reviewing the degree of success that has been achieved in limiting population growth, the question arises as to why only a few countries have made impressive headway concerning this problem, while the preponderance of developing countries have not. Perhaps the answer, quite simply is that population, and even development are not top priorities in most developing countries.

The principal reason that there have not been more instances of sustained economic development and of efforts to limit population among the developing countries is that their leaders and their policymaking processes have other goals and objectives which compete for resources and attention. These competing objectives can include: emphasizing spectacular showcases such as hotels, dams, and other attention getting structures; seeking greater national recognition and prestige in the international arena; acquiring advanced modern military equipment and technology without concern for their effectiveness for productivity; resolving territorial and other disputes with traditional adversaries; and emphasizing international redistribution rather than concentrating on domestic economic growth.

Other reasons that overpopulation and economic development are not priority goals may be attributed to the uncertainty of success and, more importantly, the long time frames inherent in population dynamics—time frames that extend far beyond the length of the official careers of most political decisionmakers.[99]

In view of the current dismal economic situation, it does not seem likely that developing countries are going to be financially able, much less highly motivated to press ahead with efforts to cure or ameliorate their respective human and economic development problems in the near future. Moreover, little has changed

---

[97] Baldwin, C. Stephan. Population and Planning for Development, Populi. Journal of the United Nations Fund for Population Activities, v. 7, no. 1, 1980, p. 27.

[98] Interurban Man: the Dynamics of Population in Urban and Rural Life. Populi Journal of the United Nations Fund for Population Activities, v. 7, no. 3, 1980, p. 6.

[99] See Wolf, Charles, Jr. Economic Success, Stability, and the "Old International Order." International Security, v. 6, no. 1, Summer 1981, p. 91-92; see also Gordon, Lincoln. Development and Population. In Wilson, Thomas W., Jr. World Population and a Global Emergency. Washington, D.C., Aspen Institute for Humanistic Studies (1974), p. 53-57.

over the past 10 years to suggest that the leaders of developing countries are not going to continue to favor economic development over human development. Indeed, there is concern that the problem of governmental budget cutbacks will intensify in the near future, and that the amounts allocated for human development will be even less than has been the case in the past. In this connection the 1981 annual report of the World Bank states:

> The pressures of adjustment, especially budgetary stringency, could lead governments to cut back on human development programs. This could compromise precisely those aspects of development in low-income countries most conducive to poverty alleviation. Cutting non-salary recurrent expenditures, in particular, can damage these programs seriously while saving little.[100]

In purely economic terms and in the short run, multinationals presumably would benefit from an emphasis on economic rather than human development. They need an economic infrastructure that guarantees them roads, transport and communications systems, energy, and other components necessary to insure easy market access.

Multinationals have other needs, however. They require white collar workers, which implies educated workers. They tend to locate near large cities. But as we have seen, over the next 20 years, the population in many cities is expected to swell enormously in size. If provisions for human development have not kept pace with the enormous educational, health and other demands of this burgeoning population, the needs of multinational corporations will encompass much more than economic infrastructure. "Illiterate, untrained, disease-weakened people are unlikely to contribute effectively to the development process." [101] Great masses of impoverished, ignorant, abysmally miserable human beings can create much havoc in terms of terrorism, riots, civil strife, and shortages of all kinds. Under such circumstances, the very survival of a given highly visible multinational could be threatened.

U.N. official, C. Stephen Baldwin, has summarized several kinds of population information for planners in developing countries. Multinational corporations also might profit from such information since both multinationals and developing countries try to make accurate plans to assure increased industrial growth. Such plans require accurate population data. Information is needed in order to anticipate the extent of aggregate demand over a specified planning period for the different products of old and new industries. They need to know how many people there will be in terms of labor supply and consumer demand; and they need to anticipate this labor supply and consumer demand in terms of age groups and regions in which they might be concentrated.[102]

In summary, it would appear to be very much in the interest of multinational corporations to factor potential overpopulation problems as well as efforts to anticipate possible political and economic

---

[100] World Development Report 1981. The World Bank. August 1981, p. 110.
[101] World Population: Silent Explosion, p. 18.
[102] Baldwin, C. Stephen. Population and Planning for Development. Populi. Journal of the United Nations Fund for Population Activities, v. 7, no. 1, 1980, p. 25.

climate into their plans when choosing one site over another in the Third World or in order to survive successfully in those countries in which they are already located.

U.S. MATERIAL DEPENDENCY AND THIRD WORLD POPULATION TRENDS*

Introduction

While many Americans are concerned about the continual availability of Middle East oil, rising energy prices, and other facets of the "energy problem," most citizens are not aware of the increasing dependency of the United States upon foreign sources for non-energy mineral commodities considered to be strategic to the economy and the military capability of the United States. In 1980 the United States imported 91 percent of its chromium requirements, 88 percent of its platinum-group metals, 93 percent of its cobalt, and 97 percent of its tantalum and manganese.[103] The Bureau of Mines reported 19 minerals and metals with import-consumption ratios of 50 percent or more in 1980, and for 10 of those materials the ratio was 90 percent or higher.[104] By contrast in 1980, the United States imported 42 percent of its required oil. This situation did not just happen nor is it necessarily a problem. Potential problems begin to emerge when one explores the use or applications of some of these minerals; the source of supply; and the circumstances (including high population growth) which might limit in part or in total access to existing mineral sources. The remainder of this paper deals with these points, and suggests some possibilities for reducing U.S. mineral dependency.

Historical Background

As the United States grew from a colonial to an industrial nation, its need for minerals increased dramatically. At the time of the Revolutionary War the annual per capita consumption of minerals in the colonies is estimated to have been around 1,200 pounds, of which 1,000 pounds were sand and gravel; 112 pounds brick and lime; 40 pounds coal; 20 pounds iron; and the balance copper, glass, lead, potash, salt, nitrates, sulfur, and zinc.[105] During the succeeding 200 years, the population of the United States increased nearly ninety-fold from 2.5 million to over 220 million and the annual consumption of minerals increased less than forty-fold to about 41,000 pounds per person. With new advances in technology, the mix in mineral use and the need for minerals changed significantly. Currently, more than 4 billion tons of new

*Dennis L. Little, specialist in Futures Research and Population Policy, and James E. Mielke, specialist in Marine and Earth Science.

[103] Warshofsky, Fred. Strategic Minerals: The Invisible War. Readers Digest, February 1981.

[104] Calingaert, Michael. U.S. Mineral Maneuvers Must Be Global in Scope. American Metal Market. May 1981, p. 38.

[105] Mineral Facts and Problems 1975 Edition. U.S. Department of Interior Bureau of Mines. Bulletin 667. Washington, U.S. Government Printing Office, 1976, p. 1.

minerals are needed each year to sustain the U.S. economy. Until 1940 the United States had been a net exporter of non-mineral commodities; but now, according to one estimate, by 1985 the United States will depend on imports for as much as half of its basic supplies of raw materials. If this forecast is correct, and the trend continues, the deficit in the Nation's mineral balance of trade could approach $100 billion by the year 2000.[106]

As these use patterns developed in the United States, the richest and most readily available domestic resources were utilized first. As our Nation exhausted such deposits, new sources of supply had to be found. Since a decrease from 2 percent metal content to 1 percent metal content requires moving and processing twice as much rock to gain the same tonnage of metal, U.S. companies have generally found it cheaper to buy and ship higher grade ore from foreign sources.

Of the 91 categories of non-fuel mineral commodities classified by the U.S. Bureau of Mines, the United States is a net exporter of 18, self-sufficient in 7 others, and a net importer of the remaining 66. According to Public Law 96-41, the "Strategic and Critical Materials Stockpiling Revision Act of 1979," 29 of the 66 could be classified as strategic and critical. The law's definition reads as follows:

> The term "strategic and critical materials" means materials that (A) would be needed to supply the military, industrial, and essential civilian needs of the United States during a national emergency, and (B) are not found or produced in the United States in sufficient quantities to meet such need.
>
> The term "national emergency" means a general declaration of emergency with respect to the national defense made by the President or by the Congress.[107]

The President is authorized to determine which materials are strategic and critical, and the quality and quantity of each such material to be acquired.

Currently 29 minerals or mineral groups have established stockpile goals and are thus considered strategic and critical. For 19 of these the United States imported 50 percent or more of its requirements in 1980 or is expected to import at that rate in the year 2000. Table 1 reflects current material import dependency, major foreign sources, material usage, and the expected annual increase in demand through 1990. The next section of this paper focuses on the significance of some of the material applications.

---

[106] U.S. General Accounting Office. Learning to Look Ahead: The Need for a National Materials Policy and Planning Process: Report to the Congress by the Comptroller General of the United States. [Washington] 1979. [EMD 79-30, Apr. 19, 1979.]

[107] Other definitions are used so there may be some statistical variations when comparing reports, articles, etc.

TABLE 1.—U.S. NET IMPORT RELIANCE OF METALS AND MINERALS AS A PERCENT OF APPARENT CONSUMPTION

Material	1980	2000	Major foreign sources	Material usage	Increased demand expected annually through 1990
Antimony	53	96	China, Bolivia, Mexico, Republic of South Africa, Canada.	Flame retardant, batteries, ceramics, chemicals.	3.1
Asbestos	76	86	Canada, Republic of South Africa.	Pipe, floorings, roofings, friction products, insulation, coatings.	0
Bauxite and Alumina	94	80	Jamaica, Guinea, Australia	90 percent for aluminum, remainder for chemicals, abrasives, refractories.	5.0
Cadmium	62	61	Canada, Australia, Mexico	Plating, batteries, pigments.	1.8
Chromium	91	89	Republic of South Africa, Philippines, U.S.S.R., Turkey, Zimbabwe.	Construction, machinery, transportation, paints, chemicals, ceramics.	3.2
Cobalt	93	76	Zaire, Zambia, Finland	Aerospace, cutting tools, electrical, magnetic materials catalysts.	2.5
Columbium	100	100	Brazil, Canada, Thailand	Construction, petroleum industry, transportation, machinery.	6.0
Diamond (industrial)	100	100	Republic of South Africa	Machinery, transportation equipment, grinding and cutting equipment.	4.8
Fluorspar	84	96	Mexico, Republic of South Africa, Spain, Italy.	Steel and aluminum production, fluorine compounds.	2.7
Manganese	97	100	Republic of South Africa, Gabon, Brazil, Australia.	Steel production, batteries, chemicals.	1.6
Sheet Mica	100	100	India, Brazil, Malagasy	Electrical, electronics	−2.2
Nickel	73	46	Canada, New Caledonia, Dominican Republic.	Transportation, chemical industry, electrical, contruction materials.	4.0
Platinum	87	83	Republic of South Africa, U.S.S.R., Canada.	Automotive, chemical and electrical industries.	3.1
Silver	(1)	78	Canada, Mexico, Peru	Photography, electrical, silverware, solders.	3.1
Tantalum	97	87	Thailand, Canada, Malaysia, Brazil.	Electronic components, machinery, transportation.	4.0
Tin	84	79	Malaysia, Bolivia, Thailand, Indonesia.	Cans and containers, electrical, contruction, transportation (less than).	<1.0
Tungsten	54	74	Canada, Bolivia, Thailand, Republic of Korea.	Metalworking and contruction machinery, transportation, lamps, electrical.	5.0
Vanadium	15	71	Republic of South Africa, Chile, Canada.	Steel and titanium alloys, catalyst.	4.0
Zinc	58	55	Canada, Honduras, Peru	Construction materials, transportation and electrical equipment, machinery, chemicals.	1.1

[1] Net Exports.

Source: Data from U.S. Department of the Interior, Bureau of Mines, Mineral Commodity Summaries 1981 except for the projections to the year 2000 which were derived from data in U.S. Bureau of Mines, Mineral Trends and Forecast 1979. This country's future dependency on imports of these materials may be higher than these figures indicate since in the eyes of some analysts, this publication's estimates of future production in 2000 are overly optimistic. For cobalt import dependency in 2000 was calculated using an estimated primary production of 10,000,000 lbs. instead of the 20,000,000 lbs. listed in the Bureau of Mines table. Only those commodities in which the net import reliance is 50 percent or greater in either 1980 or 2000 are included in the table.

Mineral and Metal Product Usage

Americans consume about 20 percent of the world's production of non-fuel minerals. The consumption of nonfuel minerals such as iron ore, gypsum, limestone, sand and gravel is basic to the economic welfare of the country. Non-fuel minerals such as the strategic and critical metals are essential in high-technology manufacturing enterprises such as hi-fi's, computers, and sophisticated aerospace systems. They also are used in medical and dental care equipment, food processing, house paint, dry cell batteries, steel manufacturing, and fertilizers. In the aircraft industry about 83 percent of all commercial aircraft are powered by the JT8D jet engine, which contains 900 pounds of cobalt. Pratt and Whitney, the manufacturer of the JT8D, estimates that it could continue to supply its customers for 1 year after a cobalt cut-off. After 1 year, their estimates indicate that the planes using the JT8D engine would start to be grounded at the rate of 25 percent per year. Military aircraft like the F-15s and the F-16s also require 900 pounds of cobalt. According to William Schneider, a defense analyst at the Hudson Institute, on any given day the equivalent of three of the Air Force's 26 fighter wings are grounded for lack of spare parts. He notes, "On the F-15 for example, there's a serious shortage of critical high-temperature engine core parts due to a lack of cobalt." [108] Ninety-three percent of our current cobalt requirements are imported from Zaire, Zambia, and Finland.

Platinum is another metal whose use is obviously critical to the industrial production of the United States. According to the Joint Economic Committee, "this metal is doubly important, because it is used in the process of converting crude oil into gasoline and in the manufacturing of catalytic converters." [109] Based on today's technology, there would be little high octane gasoline, no catalytic emission control for combustion-engine cars, and a primitive oil refining industry without platinum. Palladium, one of the platinum group metals, is essential for coating telephone contact points and, therefore, is important to the whole telecommunications industry. In 1980, 87 percent of our Nation's platinum requirements were imported from South Africa, Russia, and the United Kingdom. Manganese is essential to the production of steel. In 1980, the United States imported 98 percent of its requirements from Gabon, South Africa, Brazil, and Australia. [110]

It seems reasonably clear that under current conditions our Nation needs continual access to strategic minerals (or their functional equivalent) if our economy is to prosper. Prolonged shortages in basic non-fuel minerals would send shock waves through the whole economy causing an enormous impact on jobs, corporate earnings, financial markets, trade, and the international position of the dollar. [111] The next section of this paper discusses some of

---

[108] Miller, James Arnold, Daniel I. Fine and R. Daniel McMichael. The Resource War in 3-D: Dependency, Diplomacy, Defense. World Affairs Council of Pittsburgh. 18th World Affairs Forum, p. 5; Warshofsky, Fred. Strategic Minerals: The Invisible War; and James, Daniel. Our Alarming Vulnerability to Mineral's Mischief. Washington Star. Mar. 3, 1981.

[109] Cited in James, Daniel. Our Alarming Vulnerability to Mineral's Mischief.

[110] James, Daniel. Our Alarming Vulnerability to Mineral's Mischief.

[111] An official West German study reveals, that if imports of just one mineral, chromium, were reduced by only 30 percent, that would force the GNP down by 25 percent and make millions of Germans jobless.

the factors which might contribute to a break in the availability of selected minerals.

Potential Supply Disruptions

> The country's fragile dependence on oil imports is only the first in a series of mineral crises that we can expect for the remainder of the century.
>
> David Kroft, Minerals Economist, 1980.

Chart I compares the mineral import reliance of the United States, the European Economic Community, Japan, and the U.S.S.R. In a relative sense, the overall non-fuel mineral import dependence of the United States is low, about 12 percent of total consumption in 1980. This is based on a total consumption of $240 billion of processed materials of mineral origin versus imports of $29 billion. This contrasts sharply with the import dependence of Europe—75 percent—and of Japan—90 percent. Canada, Australia, and other developed countries supply over two-thirds of the industrial mineral imports of the United States. The rate of economic growth in many of these countries has lagged in recent years and there is a surplus in some mines.[112] In fact the key minerals discussed in the previous section, as well as others are located in parts of the world that are either unfriendly or politically unstable. The Soviet Union, a major source of supply of the United States for chromium and platinum, imports fewer minerals; and of the minerals imported, the Soviet Union has been importing a smaller percentage of its requirements. The available statistics indicate Soviet exports of certain raw materials to the West are declining sharply and in some cases have stopped. In addition the Soviet Union has begun to import certain strategic minerals for itself and its East Bloc Allies from countries whose output has traditionally gone to the United States and its allies. In the last part of the 1970's the Soviets or the East Bloc Council of Mutual Economic Assistance have negotiated over 30 technical and economic assistance agreements with Third World countries. Almost half of these agreements feature large-scale Soviet technical aid for exploration and development of new mines, with eventual payment in the form of recovered minerals.[113]

---

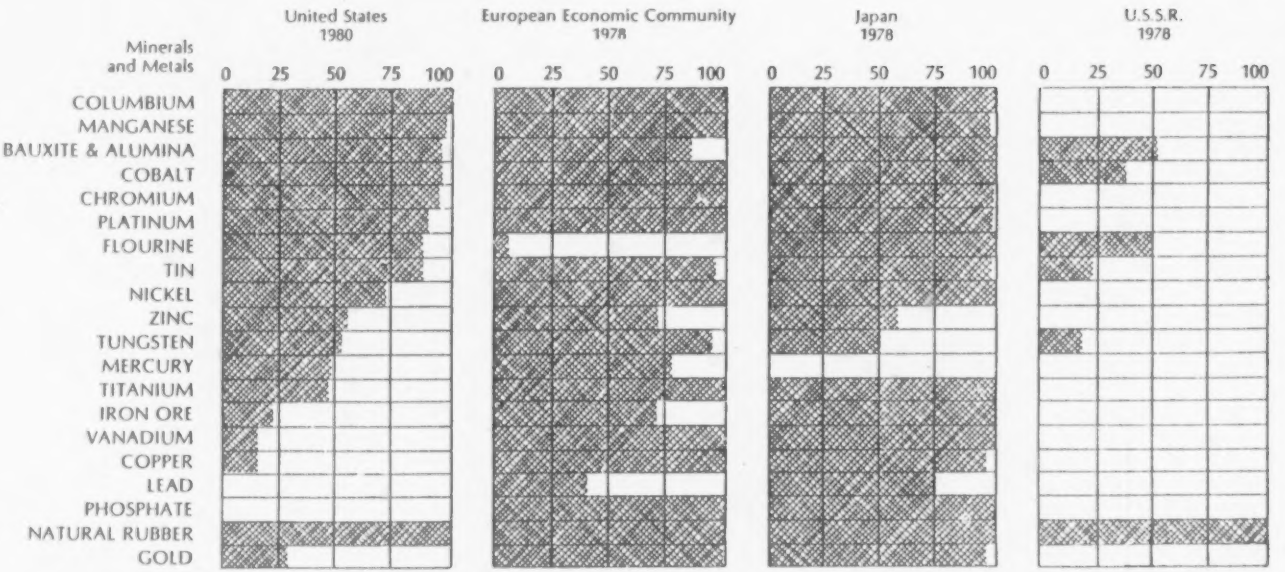
[112] Wendt, Allan E. U.S. Mineral Import Dependence and the Threat of Cartels. Materials and Society. Pergamon Press, v. 2, 1978, p. 310.

[113] Miller, James Arnold. The Resource War in 3-D-Dependency, Diplomacy, Defense, p. 5.

CHART 1

Reliance of the United States, the European Economic Community, Japan and the U.S.S.R. on Imports of Critical Raw Materials

(Imports as Percent of Consumption)



Note: Shaded area indicates imports as percent of consumption

primary source: Bureau of Mines, U.S. Department of the Interior

Some believe that this is the start of a "resource war" against the West in which the Soviet Union plans to influence and control major producers of strategic materials such as Zimbabwe, Zambia, Zaire, and South Africa and cut off their supplies to the West. Defenders of this position cite Zaire as their clearest case study. In May of 1978, the Shaba province of Zaire was invaded by 4,000 Katangese rebels (reported to have been trained and armed by Havana and Moscow). The mines where most of Zaire's cobalt is produced were flooded, and 200 white technicians were killed. The mines were retaken, but, for a period of time, there was a considerable reduction in production. Producer prices rose from $6.40 to $25 a pound—$50 on the spot market. Just prior to the invasion, the Soviets were buying large quantities of cobalt on the London market and during the shortfall sold cobalt to the United States at the higher prices. This may have been coincidence, but some analysts interpret it as part of a "resource war" that the U.S.S.R. is waging against the United States. The Soviets did embargo chromite exports to the United States during the Korean war, and would be expected to use their minerals position to their own advantage in the future as they have in the past.[114]

Rapid population growth in the Third World may also create an instability within many mineral rich Third World nations. Table II examines the past and projected population increases for those countries supplying the minerals and metals shown in table I to the United States. Together the two tables reveal that many of our Nation's non-energy mineral commodities are being imported from the less developed countries, many of which are experiencing rapid increases in population. In table II the countries have been arranged in descending order of magnitude according to the estimated percentage of population increase between 1980–2000. The table implicitly raises many questions, but answers few. For example, might sharp increases in population create instability within the rapidly growing countries and in turn result in shutdowns of supplies to the United States? Or will population growth in neighboring countries (not reflected in table III) be so great that intercountry instability occurs and supplies are reduced or cut off? Kenya is the extreme example of potential internal problems generated by rapid population growth. Although it does not border on any mineral rich country, Kenya is cited because it probably illustrates the wildest range of potential problems. In 1980 Kenya's population grew by four percent and its economy by only two percent. It is probable that Kenya will have to import food for the rest of the decade. If the current population growth rate continues, the number of school children will double by the year 2000 and the economy will have to generate 560,000 new jobs a year (double the 1980 level of 260,000).[115] All of this must take place in a country which has a 1980 per capita income of $380 (in 1980 per capita income was over $10,000 in the United States).[116]

---

[114] Barry, Paul. How To Serve Both Mars and Mammon. The Listener, v. 105. Apr. 30, 1981, p. 565; Velocci, Tony. Minerals: The Resource Gap. Nation's Business. October 1980, pp. 34 and 36; and James, Daniel. Our Alarming Vulnerability to Mineral's Mischief.

[115] Ross, Jay. Kenya's 4 Percent Birthrate Said to Create "Mind Boggling" Problems. The Washington Post. June 20, 1980, p. A-15.

[116] Population Reference Bureau, 1981 World Population Data Sheet of the Population Reference Bureau, Inc., 1981.

TABLE II.—WORLD POPULATION ESTIMATES [1]

Country	Material exported to United States	Population (millions)			Increase in population	
		1960	1980	2000	1960–1980 (Percent)	1980–2000 (Percent)
Zimbabwe	Chromium	3.6	7.4	14.0	106	89
Mexico	Antimony, cadmium, fluorspar, silver	36.4	70.0	132.2	92	89
Honduras	Zinc	1.9	3.7	7.0	95	89
Zambia	Cobalt	3.2	5.6	10.4	75	86
Madagascar	Sheet mica	5.47	8.74	15.1	60	73
Brazil	Columbium, sheet mica, tantalum, manganese.	71.5	126.4	212.5	77	68
Bolivia	Antimony, tin, tungsten	3.3	5.6	9.3	70	66
Peru	Silver, zinc	10.2	17.8	29.5	75	66
Philippines	Chromium	27.6	51.0	83.4	85	64
Zaire	Cobalt	17.7	28.3	46.4	60	64
Guinea	Bauxite	3.18	5.01	8.21	58	64
Republic of South Africa	Asbestos, chromium, diamond, antimony, fluorspar, manganese, platinum, vanadium.	17.3	29.3	47.8	69	63
Thailand	Columbium, tantalum, tin, tungsten	26.4	47.7	76.1	81	60
Dominican Republic	Nickel	3.3	5.9	9.3	79	58
Turkey	Chromium	27.5	45.3	69.4	65	53
Malaysia	Tantalum, tin	7.9	13.6	20.2	72	49
India	Sheet mica	436.9	694.1	1037.2	59	49
Indonesia	Tin	92.7	151.9	221.6	64	46
Gabon	Manganese	.472	.551	.752	17	36
Chile	Vanadium	7.59	11.1	14.9	46	34
Republic of Korea	Tungsten	24.7	38.0	50.8	54	33
Jamaica	Alumina and bauxite	1.63	2.19	2.87	34	31
China	Antimony	682	956.9	1,190	40	24
Australia	Alumina, cadmium, manganese	10.3	14.5	17.8	41	23
Canada	Asbestos, antimony, cadmium, columbium, platinum, nickel, silver, tantalum, tungsten, vanadium, zinc.	17.9	24.1	29.0	35	20
U.S.S.R.	Chromium, platinum	214.3	266.7	311.9	24	17
Spain	Fluorspar	30.3	37.4	43.4	23	16
Italy	Fluorspar	50.2	57.0	61.0	14	7
Finland	Cobalt	4.43	4.82	5.11	9	6

[1] Selected Demographic Indicators by Country, 1950–2000; Demographic estimates and projections as assessed in 1978 Department of International Economic and Social Affairs. United Nations, New York, 1980.

One could also suggest, on the other hand, that rapid increase in population might bring even greater pressures on the mineral exporting countries to protect and expand their minerals exporting position in order to create needed jobs and increase export revenues. Similar pressures to control internal unrest by maintaining employment levels and maximizing export revenues have been major factors contributing to the lack of success of past cartel attempts (other than oil) to increase prices through controlled production.

An additional question raised by table II is: will increased population growth and industrial development lead some of these countries to become competitors with the United States for these resources? In this regard, it would appear quite likely that developing countries will wish to reserve for their own use raw materials for basic industrial growth, such as manganese for steelmaking. However, many of the materials strategic and critical to the United States are employed in high technology applications for which it is

unlikely that a developing country would soon have a domestic need, and would instead prefer the export income.

Another question that may arise from the linkage of population growth and countries exporting minerals to the United States is will nations use their raw materials as political weapons to advance their own interests or influence the Untied States. If political actions are undertaken to contol internal disruptions, such as may arise from rapid population growth, what may be logical behavior in normal trade and export business may not apply. As to the future political motivations of minerals exporting countries, it would be folly to speculate at this point.

Options for the Future

Admittedly a number of measures have been or could be adopted for reducing U.S. non-fuel mineral dependency. The first and easiest is to look for stable sources of supply. Currently, Canada accounts for 25 percent of total imports. Second, where economically feasible, the sources of supply should be diversified. In 1980, the United States imported cadmium from 19 countries; mercury from 9, and tungsten from 20.[117] Third, new materials, new extraction processes, and new recovery processes need to be developed. Man-made materials which have some promise include:

Reinforced plastics
Amorphous metals
Superconducting alloys
Surface modified metals
High-temperature ceramics
Electrically-active ceramics; and
Advanced, high-technology glasses [118]

There appears to be a need to assess our current knowledge on substitutes for critical materials; to document substitution technologies; and to make this information available in a useful form.

The opening of Federal lands set aside for wilderness, ocean mining and stockpiling also might help reduce the nation's overall dependency factor. The Reagan Administration has announced a plan to purchase $100 million in strategic minerals to build up defense stockpiles. President Reagan has called it the first step in a program to decrease this nation's vulnerability. Subsequently, a $78 million contract has been signed with Zaire for the purchase of cobalt. Secretary of Interior James Watt appears determined to open wilderness areas and other Federal lands to exploration and production of minerals.[119] Finally population assistance programs might be reviewed as to their scope, efficacy, values, etc. The population factor appears to be only one facet of the material dependency question, but it is not necessarily a modest one.

---

[117] Calingaert, Michael. U.S. Mineral Maneuvers Must Be Global in Scope. American Metal Market. May 6, 1981, p. 38.

[118] Irving, Robert R. How Can We Stave Off an OPEC in Metals? Iron Age. May 25, 1981, v. 224, p. 79.

[119] Knight, Jerry and Peter Behr. In U.S., Strategic Minerals Acquired New Prominence. Washington Post. Mar. 15, 1981, p. H-1.